THE IRON TRADE REVIEW

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Freights Block Business

High Charges Seriously Interfere With Commerce—Scarcity of Spelter Causes Excitement in Galvanized Sheet Market

Extremely high ocean freights are interfering seriously with the commerce of the United States, Great Britain and other countries. Owing to the high freights prevailing for carrying ore from Spain and the Mediterranean to England, prices of steel-making pig iron have rapidly advanced in the British kingdom and additional inquiries for 30,000 tons of American iron have been received in this country. Owing, however, to the same condition that prevents shipment of ore to England, it is doubtful whether any considerable tonnage of pig iron will be shipped from this country. The freight situation also affects the ore trade and no trans-Atlantic ore is now being offered in the American market. Likewise shipments of wire and other finished iron and steel products to foreign countries are being retarded.

While the earnings of the United States Steel Corporation for the last quarter of the year were the lowest on record, it was expected that the showing would be unfavorable and it is confidently believed that the moderate improvement which has set in will continue and result in a much better showing for the present quarter. Demand for nearly all finished products is slowly improving, and considering the fact that mills are still operating at far from full capacity, prices are being well maintained. The Steel Corporation's operations are now up to 50 per cent of capacity and it is expected that this will soon be increased to 60.

Sheets

Owing to the very high price of spelter, the galvanized sheet market is excited and prices have been advanced at least $6 per ton above the recent lowest quotations. Even at 2.90c, Pittsburgh, for No. 28 galvanized, orders for immediate shipment only are being accepted. While the shortage of spelter promises to continue to embarrass mills, large stocks of galvanized sheets are on hand in warehouses.

Railroad Buying

Western railroads are placing rail orders more freely, and about 20,000 tons have been placed within a few days. As evidence of the scarcity of cars, builders of motor trucks report that they are having much difficulty in obtaining cars to meet their requirements. The Pennsylvania railroad has distributed among five steel companies 10,000 tons of rails, half of which will be rolled on the old specifications and half on the new.

Shapes

Very few structural contracts have been placed, but large tonnages are in prospect and mills are showing considerable firmness in quoting not less than 1.10c, Pittsburgh. While there is likely to be close figuring on the 20,000 tons for track elevation work at Indianapolis, the delivery of a considerable part of the tonnage will not be for a number of months and mills are expected not to make unusual concessions.

Machinery

The encouraging feature of the machinery market of the past week has been the development of a good volume of business from domestic consumers who have not booked contracts for export. Most of the domestic business is in small lots and the absence of the railroads is noticeable. The foreign demand for machine tools is decreasing.

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Take It Calmly

THE decision of the Supreme Court of the United States that an employer has the right to decline to employ a man because he is a member of a labor union simply says to the union man that he has no right to demand that his employer do what the union is not willing to do for the employer. That is, a union man who refuses to work with a non-union man whom the employer wishes to employ cannot force his own employment.

The decision, following that of the Danbury hatters' case, is of great importance and probably will be violently denounced by labor leaders, but it will be well for them to accept the decision calmly and try to reform the unions so that employers will prefer union men. The unions will be compelled to be more reasonable in their demands and the present is an excellent time to begin to establish more harmonious relations between employers and employes. Representatives of capital and labor have been getting pretty near to each other in conferences concerning the unemployment problem, and still closer relations ought to be established.

Promoting the Square Deal

ONE of the most significant results of last fall's elections was the decisive defeat of the full crew bill by the voters of Missouri. This verdict of the people of that state was accepted throughout the country as an indication of a changing sentiment toward the railroads. That Missouri is not satisfied with negative action, but is anxious to do something positive, is shown by the recent banquet tendered by the Springfield Club, of Springfield, Mo., to the officials of the Frisco and Missouri Pacific railroads in the interests of a square deal for the railroads.

The roads were represented by 25 of their highest officials, and about 300 members of various civic and commercial organizations of Springfield were present. H. T. Hornsby, general manager of the United Iron Works Co., Springfield, was chairman and the addresses of some of the railroad men whom he introduced gave valuable information and suggestions. W. B. Biddle, one of the receivers of the Frisco, made a carefully prepared statement as to conditions past and present and pointed out how, in the past, shippers and communities sought special rate adjustments to favor their particular interests, regardless of the effect on other localities and other persons, and frequently secured more concessions through influence brought to bear on some particular carrier, even when changes disturbed the relative basis of rates and led to demands for further readjustment. Mr. Biddle freely admitted that freight rates had been raised or lowered by the roads according to their own knowledge or belief and without consultation with the large business interests affected. Naturally, many mistakes were made.

After telling how both shippers and carriers had been to blame for unjust rates, Mr. Biddle pointed out changes for the better that are taking place. He described new methods in vogue and said that most traffic men are now ready to admit that shippers and manufacturers know more about some things entering into the making of freight rates than they themselves do and railroad men are seeking the advice of shippers, giving them an opportunity to be heard when important changes are under consideration.

Mr. Biddle said that no thinking man is averse to proper regulation, for railroads appreciate that governmental action has enabled them to abolish practices and conserve revenues in ways which would not have been found possible under the old conditions. Mr. Biddle made an earnest plea for reasonable regulation and said that if rates now being asked for by western lines prove to be too high, they could easily be changed.

Meetings like that held at Springfield deserve the highest commendation. They are bound to result in a better understanding between shippers and carriers, and when all directly connected in business are determined to bring about a square deal, little trouble will be encountered in obtaining the necessary legislation or action by commission. It was stated at the Springfield meeting that in 1907 American railroads spent $504,000,000 for freight

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cars, locomotives, rails and other equipment, that 80 per cent of this immense amount went into the hands of American workingmen, and that in 1914 the railroads purchased only $204,000,000 worth of equipment. Surely, the causes of the loss of business amounting to $300,000,000 are worthy of investigation, and it is to the interest of the railroads and business men generally to prevent such deterioration of railroad property as has taken place during the past few years.

The One Great Desire

FEW Americans will try to understand the intricacies of the discussion in regard to rights of belligerents, blockades, contraband and other matters connected with shipments of many kinds of products from the United States to foreign countries, some of which are at war and some at peace. The truth is that some of the most important international questions have not been definitely decided and that there is much room for discussion as to what acts violate neutrality and what do not. Sometimes the distinction between absolute contraband and conditional contraband is so fine that it is difficult for a layman to appreciate it. For example, it seems to be well settled that it is the duty of a neutral government to prevent the construction or arming of vessels of war, and for that reason Mr. Schwab gave up a big contract, but no such obligation rests upon the government as to shipment of guns and many kinds of products which are used in war.

While not seriously troubled about any of these problems, many Americans have qualms of conscience as to the ethics of making shipments of any kind of product capable of being used in warfare, but to assert that it is wrong to supply any implement of war is to declare that war is necessarily sinful and to condemn all who have been engaged in war, including our own great men like Washington and Grant, who first became famous as soldiers. Such a position would hardly be taken by anyone except the most uncompromising opponent of war of any kind at any time.

But however opinions may differ as to any of the matters to which we have referred, the predominating and very earnest desire of the American people will be to see all of the foreign nations treated with the utmost fairness and impartiality according to the very best light that the officials at Washington and all others in authority can obtain.

Helping Without Pauperizing

WITH thousands of men in nearly all parts of the country begging for work, the unemployment situation at the present time is very serious, but we believe we are safe in saying that never before was there so much intelligent effort to relieve unfortunate conditions without making paupers or causing the unemployed to use self-respect. The central idea in many leading manufacturing centers is to get jobs for men and women. Manufacturers and other employers, by systematic studying of conditions in their own plants, are managing to increase the number of employes. It is true that this must often be done at the expense of some who are already employed, by reducing the working hours or the days per week of employment. But the principle that it is better to give many men some employment rather than a few constant employment is sound.

As to the question, how far a citizen is in duty bound to be loyal to his own city, some difficult problems are presented. We believe that as a general proposition every city should use all reasonable methods to take care of its own unemployed, but we cannot sanction the criticism which has been made of some city officials and some companies that have awarded contracts for structural material and machinery outside of their own cities. This strikes us as being a rather narrow view. It might be entertained if the unemployment existed in only one part of the country, but when it is common to all manufacturing centers, the man who lets a contract today for work to be done outside of his own city may be confident that he is giving employment to men who need it as badly as do some in his own city. Hence we say, stand up for your own town, but do not be narrow in your methods.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for January, 1914. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for Dec., 1914.	Average for Oct., 1914.	Average for Jan., 1914.
Bessemer pig iron, Pittsburgh..	$14.70	$14.70	$14.85	$15.00
Basic pig iron, Pittsburgh.....	13.45	13.45	13.75	13.42
No. 2 Fdy. pig iron, Pittsburgh	13.70	13.70	13.80	13.70
Northern No. 2 Fdy., Chgo....	13.00	13.00	13.25	14.25
Lake Superior Charcoal, Chgo..	15.75	15.75	15.75	15.50
Malleable, Bessemer, Chgo.....	13.00	13.00	13.50	14.25
Southern No. 2, Birmingham...	9.50	9.50	10.00	10.50
Southern Ohio No. 2, Ironton..	12.75	12.75	13.00	13.25
Basic, eastern Pa.....	13.50	13.50	13.50	14.00
No. 2X Virginia furnace.....	12.50	12.50	12.50	12.75
No. 2X Foundry, Philadelphia..	14.25	14.25	14.50	14.75
Ferro mang., Balti.....	68.00	68.00	66.00	36.00
Billets, Pbgh.	20.00	18.50	20.60	20.00
Sheet bars, Pbgh.....	20.50	19.00	21.60	21.00
Steel bars, Chicago.....	1.29	1.19	1.30	1.33
Steel bars, Pittsburgh.....	1.10	1.05	1.17	1.20
Iron bars, Philadelphia.....	1.15	1.12	1.17	1.27
Iron bars, Cleveland, local del'y.	1.15	1.15	1.20	1.30
Iron bars, Chgo. mill.....	1.00	.95	1.05	1.13

	Today's prices.	Average for Dec., 1914.	Average for Oct., 1914.	Average for Jan., 1914.
Beams, Chicago	$1.29	$1.19	$1.30	$1.38
Beams, Pittsburgh	1.10	1.05	1.17	1.20
Beams, Philadelphia	1.25	1.20	1.25	1.35
Tank plates, Pittsburgh.....	1.10	1.05	1.14	1.15
Tank plates, Chicago.....	1.25	1.18	1.30	1.33
Tank plates, Philadelphia.....	1.25	1.25	1.25	1.35
Sheets, blk., No. 28, Pittsburgh	1.80	1.80	1.93	1.86
Sheets, blue an., No. 10, Pbgh..	1.30	1.35	1.40	1.37
Sheets, galv., No. 28, Pbgh....	2.90	2.80	2.93	2.86
Wire nails, Pittsburgh.....	1.55	1.50	1.59	1.59
Connellsvile fur. coke contr....	1.65	1.70	1.67	1.85
Connellsville fdy. coke, contr...	2.25	2.25	2.25	2.50
Heavy melting steel, Pbgh.....	11.75	10.35	10.75	11.05
Heavy melting steel, east'n Pa..	10.00	9.50	9.75	10.50
Heavy melting steel, Chgo.....	9.00	8.00	9.00	9.19
No. 1 wrought eastern Pa.....	11.75	11.50	11.50	13.25
No. 1 wrought, Chgo.....	8.75	7.70	7.75	8.70
Rerolling rails, Chgo.....	9.50	9.50	10.00	11.00
Car wheels, Chgo.....	10.00	10.00	10.50	11.32

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England Needs American Pig

And Inquiries Are Also Pending From Italy and Japan—Freight Conditions Make Exporting Difficult—Domestic Demand Light

Philadelphia, Jan. 26.—Scattered sales are all that the pig iron market in this territory now is producing. These are made up of the usual week to week taking of low grade iron by the cast iron pipe makers in eastern Pennsylvania and western New Jersey, mingled with occasional lots for the regular foundry trade. The steel works and rolling mills are buying little iron as their melt does not appreciably increase. Pipe iron sales of the week make the best showing and reach 5,000 to 6,000 tons. One Delaware river shop took 2,500 tons, Virginia foundries bought about 2,000 tons additional and several other small transactions were made. The price now openly offered for pipe forge by shops is $13.25, delivered, and business in this territory usually is being done upon or at about this basis, although some of the furnaces ask $13.50, delivered. A Bristol, Pa., shop still is figuring on 1,000 to 2,000 tons or more of forge Nos. 3 and 2 plain. A Trenton, N. J., manufacturer of sanitary ware is in the market for 1,000 tons of No. 1X and 1,000 tons of No. 2X, first half, and is expected to buy the latter at around $14.25, delivered, and the other grade at slightly higher. A Lebanon, Pa., consumer has been buying against an inquiry for 800 tons of forge. The Lenoir, Tenn., car works is out for 2,650 tons of Nos. 3 and 2X southern for first half. There is no change in the $14.25 to $14.50 range for northern No. 2X at Philadelphia, and Virginia iron remains $12.50 to $12.75, furnace, for No. 2X. Recent negotiations by several consumers have produced no further sales of basic and some of these still are under way. While there is continued talk of higher prices on basic among the makers, no actual sales of standard iron over $13.50, delivered eastern Pennsylvania, have been made; a small transaction in virtually low phosphorus basic, however, was done at a considerably better figure. Eastern low phosphorus producers are watching with interest the rising market in hematite in England and other European countries and continue to receive export inquiry, but extraordinary freights make uncertain the transfer of any business to this side. Domestic purchases of low phosphorus are light.

Pittsburgh Pig Iron Quiet

Pittsburgh, Jan. 26.—The pig iron market in western Pennsylvania and eastern Ohio continues to border on stagnation. More important consumers are under cover for the first quarter of the year, and dealers do not expect to enjoy activity for some time. Prevailing prices appear to accurately represent the market, but they have not been tested recently. The Carnegie Steel Co. now is operating 26 of its 59 stacks, having blown in two additional furnaces this week.

Melt is Increasing.

Cleveland, Jan. 26.—A careful canvass of foundries in the city of Cleveland by pig iron sellers indicates that the melt now is about 60 per cent of capacity, an increase of 10 per cent within a few weeks. Aside from this encouraging development, the pig iron market in this district is without feature. Few sales are being made.

Little Activity

Buffalo, Jan. 26.—Very little new business developed during the week. The inquiry was also slight. Prices, however, are being firmly maintained by the furnacemen for first half requirements.

Reports from the melters indicate slightly less activity than was noted a week ago.

There is a good volume of iron going forward on contracts, although producers say the specified tonnage of the

(For complete prices see page 246.)

past week is below that of a week ago.

Market Disappointing

Cincinnati, Jan. 25.—The pig iron market as a whole is disappointing. Sales are still limited to extremely small lots for prompt delivery, which are being secured through solicitation by salesmen. The general inquiry is very light and could be classed as almost at a minimum. Shipments on old contracts are going forward in only a fairly satisfactory manner. The melt of foundries in this territory is about the same as it was during December, and it shows no tendency to increase. Prices have not varied during the past week, southern Ohio No. 2 foundry being quoted at from $12.75 to $13, Ironton basis, and southern No. 2 foundry at from $9.50 to $10, Birmingham basis, both for first half shipment.

Market Continues Quiet

Chicago, Jan. 26.—Increase is noted in the volume of inquiry for northern and southern pig iron in this market and sales are being made from day to day, although the total tonnage involved is not sufficient to constitute a real buying movement. Some tentative inquiry is being received from malleable melters, but inasmuch as the greater portion of the tonnage on furnace books undelivered from last year is of malleable iron, not much buying of this grade has resulted.

While $13, Chicago furnace, is being adhered to by northern makers for No. 2 foundry and malleable, stocks on furnace yards have been well combed and most irons containing silicon equal to or greater than the No. 2 grade have been disposed of. The result is that a large proportion of the iron remaining in stock is low silicon on which a price is being made to move it.

Iron offered by non-merchant producers is having some effect in the market here and it is believed silicon specifications are not being as closely adhered to as usually is the case, resulting in a condition equivalent to lower prices when the analysis is considered strictly.

Some inquiry is being received for second half iron, but makers are refusing to quote.

The situation as to charcoal iron is unchanged and some tonnages of this product are being moved, although the demand is not large. Prices remain firm at the level maintained for some time past.

Southern iron continues to produce a heavy inquiry and considerable sales are being made, but prices remain at the same low level which has prevailed for some time with $9.50, Birmingham, as the minimum, and a number of producers holding to 50 cents to $1 per ton higher.

Market Quiet

St. Louis, Jan. 25.—The pig iron market seems to be at a standstill, with inquiries reduced to several 200-ton lots. Some local dealers say they are trying to demand $10 for southern No. 2, Birmingham basis, but it is easily obtainable at $9.50. Northern iron is held at $13, Chicago and Ironton furnaces, but there is no inquiry.

Very Little Business

Birmingham, Ala., Jan. 25.—Pig iron business through the past week has been without feature. There is a small amount of business being done and some inquiry, but nothing out of the ordinary. Business in general is said to be still considerably below normal. Some iron is still being sold for $9.50, No. 2 foundry, Birmingham, but the largest part of first quarter business, it is believed, is being done now at $9.75.

Foreign Inquiry

New York, Jan. 26.—Further inquiries for hematite (special bessemer) iron being received by sellers on this side, aggregating 30,000 tons at least, reflect the sharply advancing market on English hematite which has resulted from the interference by exorbitant ocean freight rates and lack of boats with the ore shipments of these makers from Spain and the Mediterranean. According to advices from abroad, the operations of the British furnaces are being menaced by these conditions and a sharp rise in hematite iron prices has resulted. The latest news is that sales have been made at 90s and that 100s is being asked. Inquiries received on this side include a new negotiation for 20,000 tons of iron, analyzing 0.05 in phosphorus, in sulphur and in copper, for shipment over four months to Italy; a lot of 3,000 tons of similar quality also for Italy and indefinite tonnages for Japan and other countries. An inquiry for 3,000 tons of foundry iron for Italy also has been put out. Because of the freight conditions, sellers are able to quote only prices alongside the ship and it is not certain whether any orders can be obtained on this basis.

The past week has been an extremely quiet one in the local iron market. New business offered or closed in that period has been insignificant. The New Jersey Zinc Co., which was inquiring for 1,200 tons of foundry, is reported to have closed to a nearby maker. A quiet inquiry for 1,500 to 2,000 tons of foundry has become inactive. The railroads are beginning to put out their new tariffs embodying freight advances on pig iron under the recent general 5 per cent advance. Those applying to Buffalo furnaces show the new rate to New England will be $2.58 instead of $2.45, formerly, and the same figure will apply to all former $2.45 points. Although all the tariffs are not yet out or have been thoroughly studied, it is indicated that those New Jersey points taking $1.75 from Buffalo have remained unchanged. The advances are effective Feb. 23.

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Coke Soft

Connellsville Grades Being Sold at Concessions

Pittsburgh, Jan. 26.—While the closing of the First National Bank of Uniontown has not directly affected the market for Connellsville coke, yet fuel is being offered at comparatively low prices. Reports are heard that furnace coke has been sold at $1.50, ovens, for prompt delivery, and several consumers have been able to obtain coke at $1.55, ovens. A 3,000-ton lot of blast furnace coke sold last week at $1.65, ovens, for 30 days' delivery. The 72-hour coke market is unchanged. The Connellsville *Courier*, for the week ending Jan. 16, says production was 206,850 tons, a decrease of 2,752 tons, compared with the week before.

New Contracts Scarce

Cincinnati, Jan. 25.—The coke market is still dormant. Operations in the Wise county, New River and Pocahontas fields are showing an inclination to keep only enough ovens active to supply their contracts and are selling their coal direct rather than to turn it into coke and store it. New contracts are very scarce and inquiries are at a minimum. Prices have not changed.

Dull at St. Louis

St. Louis, Jan. 25.—There seems to be good reason to believe that the 15,000-ton inquiry for foundry coke which has been on the market more than a month will develop into a sale before the close of the present week. The coke line is very dull, with Connellsville and Virginia foundry grades quoted at $2.50, ovens.

F. Augustus Kaline, aged 65, proprietor of the Goodwill Stove Foundry, Cincinnati, died on Jan. 22, at his home in the Kentucky Highlands, a suburb.

Scrap Prices Are Held

In Some Districts, But Weakness Develops in Other Centers—Sales Not Heavy

Pittsburgh, Jan. 26.—Iron and steel scrap continues to be held at advanced prices established a fortnight ago, although suggestions are heard that the market is not so strong as it was the middle of the month. Heavy melting steel is commanding $11.75 and it is understood some material has commanded $12. Other grades are correspondingly strong. The Pennsylvania railroad is offering scrap at its several shops in this district.

Scrap Makes Recession.

Chicago, Jan. 26.—Prices of scrap receded somewhat during the past few days from the figure attained by a succession of increases since Jan. 1. Large buying by more important consumers last week filled their reserves and put them out of the market for some time and demand ceased abruptly, leaving dealers with stocks on hand and not much chance of moving. Reductions of 25c to 50c were registered in many items and the market at present is quiet at the decline. Comparatively little trading is being done at present except among brokers to match their long and short sheets.

Railroads are not offering much scrap, the Soo line having a list of 1,500 tons, the Rock Island one of 1,600 tons and the Santa Fe 3,000 tons, the last including 500 tons of No. 1 cast and 1,000 tons of No. 1 wrought.

Stronger at St. Louis

St. Louis, Jan. 25.—The scrap iron market is much stronger with a tendency toward an advance in prices. Several large steel plants on the East Side put on extra forces of workmen today and it is believed they soon will be in the market. Lists put out by the railroads today are: C., M. & St. P., 1,000 tons, of which 500 tons is light steel rails; A., T. & S. F., 3,000 tons, of which 1,000 is railroad wrought, and the Toledo, St. Louis & Western, 250 tons, and the Rock Island, 600 tons.

Market Stronger

Cincinnati, Jan. 25.—The iron and steel scrap market is a little stronger, not because of increased business, but because dealers are much more optimistic than they were a few weeks ago. The melt among foundries has increased a little since the first of the year and rolling mills are again showing a tendency to operate at more nearly their full capacities. The surplus available in this territory is so large, however, that it will take a long period of activity before any effect can be noticed or prices advanced. Demand today is centered mostly on No. 1 machine cast, bundled sheet scrap and heavy melting steel.

Freights Still Interfere

Philadelphia, Jan. 25.—British buyers who have been inquiring in this market for tonnages of heavy melting steel have indicated their willingness to pay 67s, delivered, or about $16.50, delivered. Because of the extremely high ocean freight market, however, dealers on this side have not been disposed to quote other than alongside of ship. One quotation of 55s f. a. s., or $13.40 was made on several thousand tons. These figures show that buyers and sellers are considerably apart and whether any orders will result probably depends upon how badly the former must have American scrap. A new inquiry for 3,000 tons of bloom ends has been received from Italy. Nothing has occurred in the eastern Pennsylvania iron and steel industry to change the scrap situation, locally. Brokers still are outbidding the mills for steel, offering $10.25, delivered at one point to cover old orders, while the latter at best will pay only $10, delivered. There is a fair demand for wrought pipe and heavy cast and on the former higher than $10, delivered, has been paid. The volume of the market is not expanding.

Most Lines Decline

Buffalo, Jan. 26.—Within the past week, a falling off has been noted in most lines, but heavy melting steel, borings and turnings seem to have developed more demand. Prices are being held as quoted a week ago. Dealers feel confident that a revived purchasing movement will develop shortly.

Steel Bars More Active

With Prices Well Maintained—Bar Iron Also Shows Strength in the Chicago District

Chicago, Jan. 26.—Considerable activity in the market for steel bars has been evident in the past few days and this appears to be the most satisfactory finished steel product. The demand has come from various sources, agricultural implement makers taking somewhat larger tonnages and other consumers also increasing their activity. Mill operations are being quickened and additions are to be made immediately by the Steel Corporation at its Bay View plant, Milwaukee, which rolls steel bars. Conditions warrant maintenance of 1.29c, Chicago, and no shading of this figure is apparent.

Independent Advances Bars.

Philadelphia, Jan. 25.—One of the leading independent makers of steel bars has further advanced its schedule, quoting 1.10c, Pittsburgh, only through February, 1.15c for March and 1.20c for second quarter. Other makers today had not followed this lead and still were naming 1.10c, Pittsburgh, or 1.25c, Philadelphia, through the first quarter. On the other hand, there continues some minor disturbance of the 1.10c bar price. Contracting for the first quarter by consumers and jobbers in this territory now is pretty well out of the way and specifications are coming forward at a fair rate. The Carnegie Steel Co. will secure about 1,000 tons of miscellaneous steel bars for various navy yards, bids for which were taken last week by the bureau of construction and repair, of the navy department. A recent inquiry for 1,200 tons of rivet rods by a buyer in this territory seems to have been satisfied and a new inquiry for 175 tons of similar material is current for Lenoir City, Tenn.

One Company Advances

New York, Jan. 26.—An advance in the price of forward steel bars, effective Jan. 25, was announced by the Republic Iron & Steel Co., making its schedule for March delivery 1.15c, Pittsburgh, and for second quarter 1.20c. For delivery up to March 1, 1.10c, Pittsburgh, remains unchanged. Better recent bookings have placed this maker in a more independent position as to accepting much additional tonnage at prevailing prices. As far as known, however, other producers have not duplicated this advance and still are quoting 1.10c, Pittsburgh, or 1.26c, New York, for

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first quarter. Some good-sized contracts for steel bars still are being put through in this territory. Buyers generally are well covered for first quarter. The New York Central railroad has placed the large tonnage for bars for which it recently inquired.

Prices Firmly Held

Buffalo, Jan. 26.—Orders as well as specifying on material against contracts for bars, shapes and plates fell below the average of the past few weeks. Weather conditions are reported as being a material factor in causing the slight shrinkage in the volume of business for the week in this territory. The mills and agencies of the district continue to take an optimistic view of the market. The impression prevails that February will develop a total tonnage increase over January, just as the current month has exceeded in activity the month of December.

Prices for current delivery are being held firmly at 1.10c, base.

Specifications have improved for cold rolled.

The producing interests have declined to contract ahead at present prices. One large interest is asking on bars, shapes and plates 1.10c, immediate delivery; 1.15c base for next month, and a price of 1.20c base on material needed during the second quarter.

Iron Bars Stronger.

Chicago, Jan. 26. — Considerable strength has come to the market for bar iron in the past few days and rolling schedules of all producers have been enlarged. As a result of better demand and increased orders, prices have stiffened somewhat and it is believed 1.00c, Chicago mill, is the minimum with some tonnage going at 50c to $1.00 per ton above this. Figures recently made below 1.00c, Chicago, are believed practically to have disappeared and iron is obtainable now at figures not lower than 1.00c. Mill operations are more nearly full and some interests have sufficient tonnage ahead to keep their plants busy for 10 days, which is a considerably better condition than has existed for a number of months.

Hoops, Bands, Shafting

Pittsburgh, Jan. 26.—The market for hoops and bands shows no new developments. Bands are being held at 1.10c and hoops at 1.25c, although the latter product has been obtained at slightly less than the present market quotation. Specifications are described as fairly heavy. Cold rolled steel shafting is listed at 67 per cent off.

High Price of Spelter

Causes Excitement in the Galvanized Sheet Market—Prices Are Quickly Advanced $6 Per Ton

Chicago, Jan. 26.—Galvanized sheets are not obtainable. The conditions in the spelter market brought about by large foreign orders and shipments have forced makers of galvanized sheets to refuse all quotations and consumers are unable to obtain any sheets of this description from mills in this territory.

When the condition arose a rush was made by telegraph and long distance telephone, as well as by letter, to obtain contracts on the basis of quotations which had been made previously, but makers were absolutely firm and refused to take on any more tonnage than already was on their books. With supplies of spelter sufficient only to care for contracts already made and probabilities that a supply will not be available short of two months, makers have simply retired from this department and galvanized sheets are a thing of the past until spelter conditions change. Whether the information that spelter will not be available under two months is founded on facts remains to be seen, but this is the best information obtainable at present. No change has taken place in the situation as to black sheets and No. 28 gage black are quoted at 1.99c to 2.04c, Chicago mill.

Spelter Boosts Galvanized

Pittsburgh, Jan. 26.—Excitement prevailing the last few days in the spelter market, which has witnessed a rapid advance in prices, has strengthened the market for galvanized steel sheet products. Some manufacturers have withdrawn from the market entirely, and others are refusing to sell at less than from 2.90c to 3c for No. 28 gage, for immediate delivery; no material is being offered for extended shipment, so far as can be learned. While almost phenomenally high prices have been offered for spelter, some sales have been made the last five or six days. Black and blue annealed sheets are unchanged in position, the former being offered at 1.80c for No. 28 gage and the latter at 1.30c for No. 10 gage. Specifications against contracts have been coming out fairly satisfactory, and mills have increased operations to a moderate extent. Operations still are below 60 per cent of capacity, however.

(*For complete prices see page* 246.)

More Staple in East

Philadelphia, Jan. 25.—It is now apparent that 1.50c, Philadelphia, or 1.35c, Pittsburgh, for No. 10 gage blue annealed represents the actual eastern market on sheets, although, as recently reported, certain eastern makers have been asking $1 higher and have made some sales on that basis. Prices below 1.35c, Pittsburgh, however, seem to be in less evidence and round sales including one of more than 3,000 tons, have been closed in eastern territory by large middle western makers. Eastern mills report that fair sales and specifications are current and that these are considerably ahead of the December volume.

Advance at Cincinnati

Cincinnati, Jan. 25.—The sheet market is stronger and prices have been advanced slightly on both galvanized and black sheets. Spelter's advance has caused galvanizing sheets to be quoted at from 3.10c to 3.15c, Cincinnati basis. The advance in black sheets can be accredited to the stiffening of scrap prices and the fact that they usually follow galvanized sheets, especially when quotations are at rock bottom. New contracts are fair, but mills are showing a tendency not to contract at present figures for long periods ahead. Specifications on old contracts are good.

Quick Advance.

Cleveland, Jan. 26.—There has been considerable excitement in the galvanized sheet market during the past week on account of the very high price of spelter. While, as heretofore noted, a price as low as 2.60c, Pittsburgh, for No. 28 galvanized was made last week, the quotation has been advanced to 2.90c, and this is for prompt specifications only. Prices of black and blue annealed are somewhat firmer.

The Ohio Iron & Steel Co. has ordered four hot metal cars from the William B. Pollock Co., both of Youngstown, to be used in connection with the new open-hearth steel plant of the Ohio company at Lowellville, O. The cars will convey hot metal from the Mary furnace at Lowellville to the new plant.

Demand for Ship Plates

Is Still Principal Source of Orders in the East—Some Shading of 1.10c Price on Desirable Business

Philadelphia, Jan. 25.—A very satisfactory activity continues in the ship building market and two more vessels awarded the past week bring those placed with Atlantic coast yards since Dec. 1 to a total of 12. The American-Hawaiian Steamship Co. has closed for two additional 10,000-ton freight and passenger steamers with the Maryland Steel Co., duplicating the type of the fleet built for it by this yard a year or more ago. Each of these boats will require 3,500 tons of steel, which is expected to be forwarded by the Cambria Steel Co., although the Maryland company also has asked prices of eastern mills. The New York Ship Building Co. has taken a steel barge for the government for the Panama canal, requiring about 500 tons. The Texas Co. will receive bids, Feb. 5, on a tanker which will need 3,000 tons of plates and probably 1,000 tons of shapes. A number of other merchant boats continue in the market; shipping interests are demanding as prompt delivery of these boats as possible and some of them hesitate to obligate themselves on work to be furnished some months hence, fearing some change in the present lucrative freight market. The ways of eastern ship yards, however, are filling up, builders are more independent and higher prices are being quoted. On the plain material, about 1,900 tons, for 12 barges to be built by the government at Mare Island, the Jones & Laughlin Steel Co. was low on its delivered price and tied with the Carnegie Steel Co. on a Pittsburgh basis. The Worth Bros. Co. is the low bidder on about 500 tons of plates for various navy yards. The 1.25c, Philadelphia and vicinity, or 1.10c, Pittsburgh, price on plates still is subject to some shading for early delivery. Certain eastern makers who were offered fairly attractive business at slight concessions the past week declined these offers. Eastern mill operations show only slight betterment.

Buying Light

Pittsburgh, Jan. 26.—Manufacturers of plates, shapes and bars continue to ask 1.10c for those products, and no actual trace of shading can be found. Unconfirmed reports have been heard of plates selling at slightly below the prevailing price, but makers declare such reports refer to tonnages obtained before the close of 1914. Specifications against contracts continue to come out in good volume, and mills are operating at from between 45 and 50 per cent of capacity. New buying has not been heavy, to the disappointment of most mill managers.

Plates Remain Weak

Chicago, Jan. 26.—Of all finished steel products, plates seem to have gained the least strength. Sales at a shade under 1.29c, Chicago, have been made in this territory, but it appears to have come from an Ohio mill which divided its freight advantage and thus is able to make somewhat better than the equivalent of 1.10c, Pittsburgh. Other instances of shading the nominal quotation of 1.29c, Chicago, are rumored, but so little tonnage of plates is moving the market is not fairly tested.

Plates for Battleship

New York, Jan. 26.—Bids are expected to be asked by the government shortly on about 15,000 tons of steel, largely plates, for the new battleship California, which is to be built in the Brooklyn navy yard. This steel requirement is exclusive of the armor plate. Another section of the New York Municipal railway's elevated construction in Brooklyn, involving 7,000 tons of plates, is to be bid upon soon. Figures on the Portland-Vancouver bridge, calling for 4,000 tons of plates, go in Feb. 23. Eastern mills took a considerable portion of the contract recently placed by the New York Central railroad for first half shipment, calling for about 10,000 tons. Small requirements make up new business locally at present and the market is not active. Quotable prices are not changed from 1.26c, New York, or 1.10c, Pittsburgh.

Cast Pipe for Chicago

Bids Received on 16,000 Tons—Numerous Municipal Lettings and More in Prospect

Chicago, Jan. 26.—Opening of bids by the city of Chicago on 16,000 tons of large sizes Jan. 23 and 25 furnished the only feature of the pipe market the past week. Bids were opened Jan. 23 on 3,600 tons of 12 to 24-inch pipe and on this the American Cast Iron Pipe Co. was low bidder at $22.95. Figures were opened Monday on 12,400 tons of 24, 30 and 36-inch pipe and on this the United States Cast Iron Pipe & Foundry Co. was low with a bid of $22.90. Awards undoubtedly will be made in accordance with these low bids.

Municipal lettings are coming with great frequency and considerable tonnages are being taken from these sources. At Sioux City, Ia., the United States Cast Iron Pipe & Foundry Co. made the lowest bid on a tonnage of 1,700 tons, although some items were offered at a lower price by other makers. It is not known whether the award will be made as a whole or on separate items. The American Cast Iron Pipe Co. was low on 1,800 tons at Columbus, O., last week, and received a contract for 700 tons at Kansas City, Kans. The National Cast Iron Pipe Co. has been awarded 1,430 tons at St. Paul. Lettings in prospect include 1,400 tons of 12 to 20-inch pipe at Cincinnati, Jan. 29, 265 tons at Muscatine, Ia., and 100 tons at Appleton, Wis., Feb. 1.

(*For complete prices see page* 246.)

Wire Exports

Are Checked by High Freight Rates—Prices Maintained

Pittsburgh, Jan. 26. — Advanced freight rates for export shipment have tended to reduce inquiries for wire products for foreign delivery to a minimum. Consumers not only are complaining about the difficulty of obtaining bottoms, but are objecting to the high freight rates asked for European shipment. The domestic situation is unchanged. Jobbers have increased specifications slightly, but new orders are scarce. So far as is known, all makers in the Greater Pittsburgh district are asking $1.55 a keg for nails.

Liberal Specifications.

Cleveland, Jan. 26.—Specifications on contracts for wire are coming in liberally and last week was one of the best weeks for a long time for the Cleveland office of the American Steel & Wire Co. Prices are being well maintained on the basis of $1.55 for wire nails and $1.35 for plain wire.

Uncertain

As to Result of English Regulations Concerning Ferro

New York, Jan. 26.—Definite developments with respect to the lifting of the embargo on English shipments of ferro-manganese still are lacking and the uncertainty surrounding the situation is unchanged. Cable advices to direct representatives of the producers the past week have given them further authority to make sales at $68, seaboard, subject to the ability of makers to ship and to licenses being granted under the conditions against exportation previously outlined. Although, as reported previously, some companies have been objecting to obligating themselves in agreeing not to ship any steel to the enemies of Great Britain and to contiguous countries as precedent to the resumption of ferro deliveries, no serious opposition has developed in that direction. Consumers apparently are satisfied that this obligation will not interfere seriously with their business and furthermore they realize they cannot help themselves otherwise.

The market as it now stands simply is drifting and prices are altogether nominal at $68, seaboard. There are occasional reports of spot lots being sold at $70 and $75, or even more, but most of these lack confirmation although it is quite possible that such prices might be obtained where there are urgent needs. The indications are that the shutting off of English shipments is beginning to be felt a little more keenly by some consumers, particularly of the smaller class, as the inquiry is a little more active. One or two steel companies also have been in the market for several hundred tons for early shipment. Inquiries for export to Italy, Japan and other countries are being received but these are attracting little attention. It is rumored in the market that a large lot of domestic ferro is about to go forward from Baltimore to Italy. This lacks full confirmation. Some good-sized inquiries for spiegeleisen for export are in the market.

Ferro Still Uncertain

Pittsburgh, Jan. 26.—The market for ferro-manganese in the Greater Pittsburgh district continues uncertain, because of the restrictions placed upon the shipment of this alloy by Great Britain. The situation has reflected no improvement this week. Several inquiries for future delivery are pending, and several small lots of material have been sold this week, at slightly above the prevailing nominal price.

The Ohio Iron & Metal Co., Chicago, dealer in iron and steel scrap material and railroad equipment, with branch offices in Pittsburgh and Cleveland, announces the opening of a branch office at St. Louis. Armand Alexandre, of Chicago, has been appointed district manager, with offices in the Trust building, St. Louis.

Iron Mines

On Superior Ranges Being Operated at Reduced Rate

Cleveland, Jan. 26.—News from the Lake Superior iron ore ranges indicates that operations are being conducted at a greatly reduced rate this winter, and some observers express the opinion that if there should be a good demand for ore next summer, difficulty will be experienced in meeting it. It is pointed out, however, that many of the mines have large stock piles and there is also considerable accumulation of ore on docks and in furnace yards.

Effect of High Freights

New York, Jan. 26.—Sharp advances in freight rates have had the effect of causing the withdrawal of practically all offers of trans-Atlantic iron ore in the American market. It is a question whether any sales of trans-Atlantic ore now could be negotiated by buyers on this side, except at prohibitive prices. Cuba still is in a position to make deliveries of ore in this country because of the time charters that cover such a movement. The carriers, however, which have been operating in the past in the Wabana, Newfoundland, ore traffic with this country and Europe have been withdrawn and have been chartered at lucrative rates for the grain trade. Recent reports from England are to the effect that ore rates from Spain and the Mediterranean have been more than doubled and that as a result, the operations of some of the furnaces are being crippled by shortages of mineral. From Bilboa, Spain, to British ports, where the normal ore rate has been from 4s 6d to 5s, 12s and 13s have been paid under very favorable freight conditions. From the Mediterranean, where the normal range is about 5s 6d to 6s, 15s have been paid. The higher cost of ore is producing a marked advance in the price of British hematite pig iron.

The new plant of the Victor Auto Parts Co., Cincinnati, will be ready for occupancy about Feb. 15. The buildings will all be under one roof and located at Spring Grove and Durham avenues, Winton Place. All machinery has been purchased and is now being installed. The company manufactures parts and accessories for automobiles.

(*For complete prices see page 246.*)

Some Contracts

Taken by Eastern Sellers of Billets—Prices Maintained

Philadelphia, Jan. 26.—Certain eastern sellers of billets have taken recently from regular customers of ordinary and special steels contracts which in the aggregate represent a considerable tonnage. Such a condition is not true generally, however, for the open market is disclosing but small inquiries and not many of these. Some eastern sellers again are accumulating stocks of steel. Such sales as are being made, however, indicate a firm condition of prices at $21.40, Philadelphia, or $19, Pittsburgh. Offers on lots of billets by foreign buyers which recently were refused by an eastern maker have been taken up by other producers and some business may result.

Semi-Finished Moving

Pittsburgh, Jan. 26.—While no new demand for semi-finished material is reported, makers say specifications against contracts are coming out in good volume, and several small lots of billets and sheet bars have been sold at prices published by THE IRON TRADE REVIEW. The market at Youngstown continues to be quoted at about 50 cents a ton less than the Pittsburgh market. Wire rods are unchanged at $25, Pittsburgh.

Sales of Forging Billets.

Cleveland, Jan. 26.—The demand for forging billets has improved during the past few days and a number of sales have been made. While automobile makers have taken some of the tonnage, the demand is not confined to them.

Bound for Europe.

Birmingham, Ala., Jan. 25.—An order of 3,000 tons of steel billets is now being shipped by the Tennessee Coal, Iron & Railroad Co. to Europe, consignee unknown. It is generally believed the billets are going to England.

Tin Plate Shipments Heavy

Pittsburgh, Jan. 26.—Tin plate mills in the Greater Pittsburgh district are operating at practically maximum capacity, and indications are that schedules will not be materially reduced for at least several months. Consumers are specifying for normal requirements, and shipments to all sections of the country are heavy. The bulk of the tonnage for Pacific coast consumption is being shipped via the Panama canal, although some material continues to be shipped by rail.

Mills Standing Firmly

For Not Less Than 1.10c, Pittsburgh, on Large Tonnage for Elevated Work at Indianapolis—Structural Awards

Cleveland, Jan. 26.—Bids will be received on Jan. 30 on the 20,000 tons for track elevation for the Pennsylvania railroad at Indianapolis, instead of on Jan. 25, as originally announced. Of this tonnage, 8,800 tons are to be delivered within six months. This business naturally has attracted much attention, but indications point to mills standing firmly for not less than 1.10c, Pittsburgh. In spite of the keen competition among fabricators and erectors, the price of shapes now seems to be firm at 1.10c, Pittsburgh, for first quarter and 1.15c for second quarter.

A decision of the supreme court of Ohio has made it possible for city officials to proceed with the construction of the Clark avenue bridge, which will require 7,500 tons of steel and bids will be received Feb. 23. Other Cleveland projects receiving attention are the Jewish hospital, 700 tons, and an addition to the New England building, 2,000 tons. The Deshler hotel, Columbus, 1,200 tons, has not yet been awarded. Bids are being received by the architect at Chicago.

Shapes Remain Firm.

Chicago, Jan. 26.—Structural shapes continue firm at 1.29c, Chicago mill, with a moderate demand and somewhat increased sales. Lettings the past week did not aggregate as much as the preceding weeks this year, a total of slightly over 2,000 tons having been placed in this territory.

The Union Pacific Railway is in the market for 750 stock cars and the Colorado Southern is inquiring for 2,000 tons of center sills for use in its own car shops.

Structural Inquiries Heavy

Pittsburgh, Jan. 26.—Inquiry for structural material has increased in volume to a moderate extent the last 10 days. Pending negotiations, involve more than 35,000 tons. Structural shapes and plates are being held at 1.10c for first quarter delivery. Undertakings involving structural steel are listed elsewhere in this issue.

Ask Car and Ship Steel

Philadelphia, Jan. 25.—Prices on 1,000 to 2,000 tons of shapes and 200 to 400 tons of plates for February and April delivery have been asked by the Lenoir, Tenn., car works. Some nice sized lots of shapes for eastern ship builders, one of them for 2,000 tons, also are in the market. General building activity in this territory, however, remains slow and eastern shape mills continue to face a condition of light bookings and low operations. Some of these plants now are running not over 20 per cent of capacity. Talk is heard of slight concessions from 1.25c, Philadelphia, or 1.10c, Pittsburgh, being granted by makers with some freight advantage, and it would not be surprising under present conditions if an attractive order brought out a sharper cut. At the moment, however, 1.10c, Pittsburgh, is reasonably uniform in this territory. The 20,000 tons of steel asked by the Pennsylvania railroad for grade crossing work in Indianapolis is for the Indianapolis Union railroad, and whether this contract will go ahead will be decided by the directors at a meeting early in February. The Indianapolis requirements, however, have no connection with the budget recently bid upon amounting to about 19,000 tons, which is exclusively for the lines east and covers ordinary needs for the year of 1915.

Elevated Requirements

New York, Jan. 26.—Bids have been asked for Feb. 4 on a section No. 1 of the Jamaica avenue elevated railroad extension in Brooklyn, by the New York Municipal Railways, which will require 13,000 tons. Beyond this inquiry, new structural business has continued to develop slowly in this district and awards and inquiries are light. Requirements of the railroads in the market are especially few and practically no tonnage now is current. The open price on shapes, in this district, remains 1.21c, delivered, or 1.10c, Pittsburgh, but it is not believed that this figure would be maintained by all sellers on an attractive order, as some of the mills, notably in the east, are in a poor position on orders. There is not much talk of price shading at present, but there are very few attractive tonnages now being offered.

CONTRACTS AWARDED.

Farmers Security Bank building, South Bend, Ind., 628 tons, to Rochester Bridge Co.

Steel centering for Brooklyn - Brighton Bridge, Cleveland, O., 246 tons, to American Bridge Co.

Paducah & Illinois R. R. Co., highway and railroad spans near Paducah, Ky., 253 tons.

C. & N. W. Ry. Co., bridge work for 1915, 1,050 tons.

Pier No. 7 of the Cristobal docks, Panama Canal, 5,000 to 6,000 tons, United States Steel Products Co. low bidder and award is expected to be made to the American Bridge Co.

State Hospital at Binghamton, 250 tons structural, general contract to Durolithic Co., Buffalo.

Niles building, Boston, 500 tons, awarded New England Structural Co.

Arcade building for Standard Oil Co., lower Broadway, New York City, 600 tons. Awarded Hay Foundry & Iron Works.

Bridge for Chesapeake & Ohio railroad, 225 tons. Awarded Phoenix Bridge Co.

CONTRACTS PENDING.

Track elevation and approaches to Union station at Indianapolis, Ind., for the Pennsylvania Lines West, 20,000 tons. This figure does not include steel for a proposed station and sheds, bids on which probably will be asked at an early date.

Clark avenue bridge, Cleveland, 7,500 tons.

Chicago, Burlington & Quincy railroad, 2,000 tons of channels.

Dishler hotel, Columbus, O., 1,200 tons.

Addition to New England building, Cleveland, 2,000 tons.

Office building for the Victor Talking Machine Co., Camden, N. J., about 1,000 tons. Bids being taken.

Maternity hospital, University of Pennsylvania, Philadelphia, 200 tons. Bids being taken.

Column cores for Belmont building, Philadelphia, 150 tons. Bids being taken.

Section No. 1 of the Jamaica avenue elevated railroad extensions of the New York Municipal Railways Co., Brooklyn, 13,000 tons. Bids to be received Feb. 4.

Bridge for Cumberland valley railroad at Harrisburg, 400 tons. Bids being taken.

Good Prospect

For Sale of Galvanized Sheets by Warehouses

Chicago, Jan. 26.—Considerable inquiry is being received by warehouses in almost all lines and the general improvement is reflected by the demand for materials from store. Although mills are entirely out of the market for galvanized sheets, no change in the price from store has been made.

Signs of Improvement.

Cleveland, Jan. 26.—The warehouse business in the Cleveland district, which has been at very low ebb for many weeks, shows some signs of improvement. Large stocks of galvanized sheets are on hand and doubtless will be in active demand at an early date if the mills are unable to obtain spelter at reasonable prices.

Shapes in Demand

Cincinnati, Jan. 25.—Warehouse business continues about the same as it did throughout December and the first part of the present month. Structurals are selling the best of all materials carried by local dealers, and are quoted at from 1.80c to 1.85c. Steel bars are quoted at from 1.70c to 1.80c, to which price they declined last week. Iron bars are quoted at from 1.60c to 1.70c. Warehouse prices on sheets are unchanged.

(*For complete prices see page* 246.)

Looking for a Boom

In Iron and Steel in England—Serious Economic Conditions Resulting From the War

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Jan. 15.

The military situation is on the whole cheerful. It is quite true we are not capturing much of the territory held by Germany, but the general view seems to be that we are getting the better of the wearing down process, and we are preparing to do still better, as it is commonly reported that within the next few weeks at least a million soldiers will be transferred to the battlefield in Flanders. Khaki is the prevailing color in the streets, and every south-bound train conveys Kitchener's soldiers nearer the seat of war. Many colliery proprietors with mineral to move have been warned that the government will shortly require complete control of the lines for the movement of troops. Trade continues abundant in nearly all branches, and everyone is looking forward to a boom in iron and steel. Our troubles are chiefly economic, arising from great scarcity of labor, enormously expensive freights, rapid increase in the price of food, and a great scarcity of ships. Apparently, in all these districts we may console ourselves that we are better off than the enemy. The Germans are finding it necessary to economize to the utmost limit, and while their chancellor asserts that they have copper in sufficient quantity to finish the war, the same newspapers which report the interview tell of copper being seized in large quantities in Belgian churches, and electric lighting installations, which happen not to be much wanted being torn down for the sake of the wire. The Kaiser's men are also taking the metal from the soldiers' helmets for the same purpose, while at the same time putting up the price of copper and aluminum to famine figures. Large quantities of church bells and household utensils are also being melted down.

It is notorious that huge shipping profits are being made. It is believed that a record was created by the steamship Cymric which arrived at Liverpool this week with freights worth £23,000. There is a strong demand that the government shall intervene and impose some sort of regulation. There is a huge demand for ships, and up to four o'clock, Wednesday, 21 merchant vessels arrived with cargoes in the Mersey; yet not one of these could be accommodated with a berth to unload. The congestion at the Liverpool ports is causing serious trouble. In response to urgent representations the government has authorized the use of a number of interned German steamers; but the whole of these will be quite inadequate to meet the case and orders for new ships are pouring in at a rate with which even the Clyde and North Eastern ship building ports are unable to deal. In Birmingham, labor completely dominates the business situation. Men are being advertised for here and promised £3 10s to £4 5s per week for simple machine work. It is clear that trade must be greatly restricted as the result of further zeal in the direction of recruiting, although it is fully recognized that many more soldiers will be required.

Pig Iron

Yesterday's quarterly meeting, in Birmingham, was crowded and decidedly animated. There was business for everybody who cared to take it, and many thousands of tons were refused. The business booked was all at fairly substantial advances on recent quotations. Yesterday's quotations in Birmingham were several shillings above those of the previous quarterly meeting. Northampton was quoted at a minimum of 56s ($13.44), a rise of 2s (48c) on the week, and Derbyshire 60s ($14.40). The latter is a good quality pig, much called for for government work and consequently the market is a strong one. The Cleveland trade has similarly very much improved, the quotation for warrants now standing at 55s ($18), with 55s 10d ($18.20), three months. Bessemer hematites on the west coast are quoted 81s ($19.44) and 82s ($19.68), with 88s ($21.32) to 89s ($21.56) for special sorts. Prices are rising sharply in the west of Scotland, where hematite brands have sold at 82s 6d ($19.80).

Finished Iron and Steel

It is a long time since consumers were so eager to place their business as at yesterday's quarterly meeting. There was a crowded attendance, with a strong contingent of Welshmen, and a fair sprinkling of shipping agents. The mainspring of the revival is clearly a heavy government demand supplemented by large orders from our European allies, who are unable to meet their own requirements. Demands for steel for the British government and for Russian military purposes were very heavy. Some lots of 500 to 1,000 tons for private consumers were refused through inability to promise delivery before April. A remarkable feature was the large inquiry for half-finished steel from British consumers who formerly bought from the continent.

The great run was upon steel. Joists and plates were advanced 10s ($2.40) per ton, thus bringing them into line with sections advanced a week ago. There was a further rise in billets which are now at a minimum of £5 12s 6d ($27) for bessemer and £5 17s 6d ($28.20) for open-hearth, but some firms would not sell under £6 ($28.80).

Every description of iron was dearer with the exception of marked bars. The standard figure for this is £9 ($43.20) or 10s ($2.40) above that of a year ago.

The tin plate trade is believed to be better in tone, but business is greatly restricted by government prohibitions and shipments in financial restrictions. It is feared that some of the mills will have to close down on these accounts, and the Welshmen are now substantially agreed that a considerable part of the trade they have been doing will now find its way to American mills.

Series of Lectures for Employes

Employes of the Cleveland Crane & Engineering Co., Wickliffe, O., on Jan. 21, held the first of a series of educational meetings. Thomas D. West, chairman of the West Steel Castings Co., Cleveland, lectured on "Founding as an Art." The lecture was illustrated with stereopticon views and covered in a thorough manner the progress made in the last quarter century in promoting the efficiency of foundry operations. The employes of the Crane company are organized as the Booster's club and will meet regularly during the winter, at which time other lectures will be given. The general arrangement for the series is in the hands of C. C. Robbins, secretary and general manager of the Cleveland Crane & Engineering Co.

Hill, Clarke & Co., New York and Boston, have taken the selling agency in the New York district for the grinders and shapers manufactured by the Queen City Machine Tool Mfg. Co., Cincinnati.

Foreign Trade Problems

Discussed at Large Convention at St. Louis—Views of Farrell, Redfield, Hill and Others

The second national foreign trade convention was held at the Planters' hotel, St. Louis, last Thursday and Friday. There was a large attendance of representative business men and others. A number of papers of high grade were presented, including the following: Government Regulation of Commerce as Affecting Foreign Trade, by W. L. Saunders, chairman of the board, Ingersoll-Rand Co., New York City; Co-operative Foreign Selling for Smaller Manufacturers, by H. C. Lewis, general manager, National Paper & Type Co., New York City; An American Merchant Marine, by Welding Ring, of Mailler & Quereau, New York City; Export Trade and Neutral Duty, by Carman F. Randolph; Problems of the Smaller Manufacturer and Merchant in Development of Foreign Trade, by W. C. Downs, United States commercial attache for Australasia; Commercial Education for Foreign Trade, by Prof. Edwin F. Gay, dean of graduate school of business administration, Harvard University.

Alba B. Johnson, president of the Baldwin Locomotive Works, presided and the opening address was delivered by William C. Redfield, secretary of commerce. One of the interesting features of the convention was a discussion as to how best to build up the American merchant marine. Along this line a paper by James J. Hill, chairman of the board of directors of the Great Northern railway, was read for the author, who was unable to be present. Mr. Hill expressed the opinion that congress ought to place American shippers and ship owners upon an absolute equality with those of competing nations. He is opposed to a subsidy of any kind.

Secretary Redfield spoke in support of the Alexander shipping bill. He said he had been advised by the English ambassador that there was no diplomatic objection to Americans buying German ships. Mr. Redfield's position was vigorously opposed by some of the delegates.

President Farrell, of the United States Steel Corporation, was a conspicuous delegate. He held the closest attention while he pointed out the various movements under way to develop the foreign trade of the United States and told of the further necessary movements, both before and after the end of the war. He said that the principle of the nation's task might well be embodied in the following axiom for our governmental and business guidance:

"Foreign trade, being a vital element of domestic prosperity, concerns every citizen, and should be fostered by governmental, commercial, transportation and financial co-operation under a national business policy designed to muster every resource in its maintenance and development."

"Co-operative foreign selling organizations, economizing for their different members the expense of direct representation, seem to offer," said Mr. Farrell, "supplementary to dealings through established commission or trading houses, the only direct method whereby the smaller manufacturers or merchants may build up their over-sea trade, but, since there is a great difference of opinion as to the legality of such combinations, the improvement of the position of the smaller manufacturers is now being made the concern of larger companies, whose facilities and knowledge of the problems attendant on foreign trade development are at the disposal of the smaller producers, appreciating as they do that any increase in trade redounds to the benefit of all."

An Early Riser

The St. Louis Post-Dispatch has an interesting story connected with the national foreign trade convention. It says that Miss Sarah M. Hawley, public stenographer, in charge of registration, was on duty at 6:45 a. m., last Thursday morning in the Moorish room on the parlor floor of the Planters' hotel, St. Louis. She had no idea, that anyone would be ready to register before 9:00 o'clock, but almost immediately after her arrival, a tall gentleman with a gray mustache appeared and very politely inquired who was expected to attend the convention. Miss Hawley replied, "Oh, all the big men in the United States engaged in making steel and other things."

"Has anyone registered yet?" said the gentleman.

"Why no, they don't get up so early," replied the lady.

"It would be a joke if I put my name at the top of the list, wouldn't it?"

"Yes," said Miss Hawley, "but of course, you couldn't get into the convention unless you had the proper credentials."

The early morning visitor took one of the registration blanks and wrote across the top line: "James A. Farrell, president United States Steel Corporation."

"My goodness!" said Miss Hawley. "Why didn't you tell me. I never would have expected to see you here at this hour."

"No. I was a little late in getting up this morning," said Mr. Farrell.

Rail Orders

Are Being Received Very Slowly—Few Awards of Cars

New York, Jan. 26.—Rail orders have come slowly the past week. The Pennsylvania railroad, as expected, in the week, placed a trial lot of 10,000 tons, divided equally among the Steel Corporation, the Bethlehem, Pennsylvania, Cambria and Lackawanna companies. Each company will roll 1,000 tons under the new and 1,000 tons under the former specifications. The results obtained from the manufacturers of these lots will guide the company in the award of the remainder of its 170,000-ton inquiry for 1915. Other rail tonnages are under negotiation in the east and west, but the roads seem reluctant to make distribution. The Portuguese government railways continue to figure on 28,000 tons, but the freight rates quoted to independent makers on this order have been so high, around $19 a ton, that it has made competition out of the question.

Car business is very slow and there are few awards or inquiries. The Pennsylvania railroad is reported to be preparing to make some purchases of cars, but this matter is in an indefinite form at present. There is more doing in locomotives than in cars, but this is not of important proportions. The Baldwin Locomotive Works is expected to receive the order for 100 locomotives for France.

Representatives of the Grecian State railways, which recently placed 200,000 steel sleepers or ties with two steelmakers in this country, now are arranging the final details of this matter, and it is thought likely that further purchases will be made, since the original inquiry called for 500,000 steel ties.

In New Quarters.—The Hugo Burgheim Co., Cincinnati prominent dealer in iron and steel scrap and equipment, has moved its offices to larger quarters in suite 601 Mercantile Library building, that city, because the former quarters at 306 Mercantile Library building are not of sufficient size to care for the increasing business of the company, in iron and steel scrap, specializing on relaying rails.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

J. Leonard Replogle, vice president and general manager of sales of the Cambria Steel Co., with headquarters at Philadelphia, has terminated, by resignation effective March 1, a connection of 26 years, with that company, and will become vice president and general manager of sales of the American Vanadium Co. In his new connection, his headquarters will be at both New York and Pittsburgh. Mr. Replogle is one of the best known of the younger group of steelmakers. His position of prominence in the affairs of the Cambria Steel Co. in recent years, was attained by a long period of capable service in the interests of that corporation. Beginning with office boy at the age of 13, Mr. Replogle's long series of promotions has included the positions of clerk, shipper, assistant superintendent of the axle department, superintendent of the forge and axle department, manager of orders, assistant general superintendent, assistant to the president and vice president and general sales manager. The latter two positions he has held for the last two years. In his new connection, he is undertaking wider responsibilities and will devote himself to the further extension of the market for vanadium steel products. Mr. Replogle is 38 years of age.

J. LEONARD REPLOGLE

In an official statement, President W. H. Donner, of the Cambria Steel Co. announces that C. B. McElhany, who has been assistant general manager of sales, will succeed to the position of general manager of sales.

H. J. Wise has been appointed general manager of sales for the American Refractories Co., at Chicago.

G. G. Ulster, late of Fort William, Ont., has been placed in charge of the London, Eng., office, opened by the Canadian Car & Foundry Co., to look after foreign business.

Charles E. Dinkey, superintendent of the Edgar Thomson Works of the Carnegie Steel Co., Braddock, Pa., inspected plants of the company in the Youngstown district last week.

Theodore A. Schwengel has been appointed general manager of the Merchants Steel & Supply Co., Marquette building, Chicago. Mr. Schwengel has been identified with the scrap iron business in Chicago for the past 16 years.

G. F. Ehrenzeller, Pennsylvania building, Philadelphia, now is representing the Carlton Iron Co. of England, manufacturer of ferro-manganese and spiegeleisen in addition to his other connections for iron ores, manganese ores, ferro alloys and metals.

H. S. Stebbins, who had been connected with the iron ore firm of Oglebay, Norton & Co., Cleveland, since Feb. 1, 1892, working his way up from a minor position to the one of large responsibility which he has long filled, has resigned. Mr. Stebbins is now enjoying a vacation in the east and is not ready to announce his business plans.

J. Frater Taylor has resigned as president of the Lake Superior Corporation, Sault Ste. Marie, Ont., in order to devote his energies to the Algoma Steel Corporation, Ltd., of which he is president and general manager. Thomas Gibson, of Toronto, was appointed to fill the vacancy caused by the resignation of Mr. Taylor. Mr. Gibson has been associated with the allied interests at the Soo for a number of years.

Dwight S. Guthrie, for several years manager of the Cleveland office of the Republic Iron & Steel Co., was tendered a farewell dinner at the Hollenden, Cleveland, Jan. 22, by about 30 of his friends. He was presented a silver loving cup with the fac-simile of the autograph of each of those giving the dinner inscribed upon it. The names were: C. W. Scofield, L. D. Latty, Henry Holt, G. C. Lucas, Henry Chisholm, D. J. Champion, N. J. Clarke, George S. Case, R. S. Hall, Harold Alexander, Alfred B. Bower, R. M. Kilgore, Myles E. Ewing, A. T. Merriman, F. H. McIsaac, John C. Chandler, A. M. Foster, J. F. Harrison, N. T. Jones, Charles Harbaugh, James R. Mills, Frank W. Davis, J. E. Williams, W. B. Smyth, R. S. Le Barre, William Smith, C. H. Palmer and F. E. Myers, Ashland, O.

H. B. McMaster, who recently resigned as commissioner for the Associated Metal Lath Manufacturers to become manager of branches for the Berger Mfg. Co., Canton, O., will take up his new duties Feb. 1. Mr. McMaster went to Youngstown at the time of the organization of the General Fireproofing Co., of which he was secretary when he resigned in 1908 to become manager of sales for the rod and wire department of the Youngstown Sheet & Tube Co. He left that concern in 1910, and in addition to his work with the Associated Metal Lath Manufacturers, was manager of the Ward Nail Co., in the reorganization of which he took part. During the year 1914, he had charge of the bureau of development, organized by the Association of Sheet and Tin Plate Manufacturers, primarily for the purpose of launching a national campaign for concerted promotion of the sheet metal industry.

H. B. McMASTER

Money and Iron: Fact, Comment

Marcosson's Article on Finance Discussed

President Clarke Heartily Indorses Suggestions—United States Steel Corporation Passes Dividend—Earnings Lowest in Its History

The article on New Finance for Steel and Iron, by Isaac F. Marcosson, published in the annual review number of THE IRON TRADE REVIEW, Jan. 7, presented in a very striking manner some important suggestions concerning which there is a wide difference of opinion. In the course of his article, Mr. Marcosson said:

"Up to the time of the federal reserve act, most of our commercial paper was in the form of the old-fashioned promissory note. It was nothing more than an evidence of an individual loan, practically a personal matter between banker and client. Likewise it was a dead piece of paper that did no service in the work of the outside business world. Until paid or renewed, it remained idly in the portfolio of the bank. In the language of war, it was a solitary soldier of trade standing alone with no aid from any of its kindred. Save in isolated cases of paper bearing the name of men like John Wanamaker, it was seldom traded in.

"But take that same promissory note which remained dead and lifeless in the banker's portfolio, and make it part of the European system (and now happily part of the system which now prevails in the United States), and it immediately becomes a live aid and asset of commerce. This is accomplished through an endorsement on the back of it by the banker or an acceptance on the face of it. It then becomes a bill of exchange. What was an immovable investment is immediately converted into a quick, liquid property.

"By such a system which, as most people know, has been in vogue in Europe for many years, the banks do not need idle hoards of cash reserves but live reserves of liquid credit, each piece representing a definite business action whether it is the conversion of ore into iron or cotton into goods. Europe has escaped periodic depressions because she has just such a system of elastic commercial paper. It created the international medium of exchange that made the whole world a market for European products. It can do the same for us.

"Take, for example, the case of pig iron. A suggestion has been made and considerably discussed which would create a sort of credit revolution. It is to make all contracts for the sale of the product on an agreed time payment, so that when bills of lading and invoice are sent, they may be accompanied by an acceptance. This acceptance, like the English document of the same name, is nothing more than a time draft. The buyer will agree in advance on the time and place of payment. It is like a check dated ahead. The seller can immediately discount this acceptance at his bank and that bank, in turn, can re-discount it at the federal reserve bank.

"Applied to iron and steel, such a process would loosen an immense amount of capital and would help to make one dollar do the work of two or three."

The following letters express varied views concerning the above ideas of Mr. Marcosson. Letters to be published next week will express still different opinions and we trust that in turn those expressions will draw out others and that the ultimate result will be of practical value to the iron trade.

Agrees With Mr. Marcosson

By E. A. S. Clarke

President Lackawanna Steel Co., New York

I agree very fully with Mr. Marcosson's article on New Finance for Steel and Iron, which appeared in your annual review number of Jan. 7. The suggestions which Mr. Marcosson advances are exactly those which occurred to me on first consideration of the federal reserve act, and I can only say that I believe that the general use of such a scheme would prove very beneficial to the industry.

These accepted bills should form a very attractive investment for the surplus funds of banks and trust companies and should permit the manufacturer to greatly increase his volume of business without increasing his cash working capital. Today, as soon as business is active, accounts receivable increase enormously, but the proposed system which will enable the manufacturer to promptly receive cash for his goods and at the same time enable the buyer to postpone actual payment until a fixed convenient date, must, it seems to me, prove beneficial to both sides; but I think it will take some time to get the American people to adopt this new scheme.

I trust, however, that your paper will keep the matter permanently before the steel world until its successful outcome has become an assured fact.

Does Not Agree With Mr. Marcosson

By T. J. Gillespie

Treasurer Lockhart Iron & Steel Co., Pittsburgh

I have read the article by Isaac F. Marcosson on "New Finance for Steel and Iron" with very considerable interest. I do not, however, agree with the author as to the iron and steel trade receiving any material benefit from the provisions of the new federal reserve law, providing for the issuing of acceptances against shipment. Of course, every business man of any extended experience will recall the time when acceptances were very largely used, but they have been discarded for better methods.

The great bulk of the iron and steel business is on 30 days terms, or monthly settlement between the fifteenth and twentieth of the monh succeeding shipment. This applies to pig iron, ore and finished iron. There are a few exceptions in some of the finished products of iron and steel. As a matter of fact the great bulk of the sales of all classes of material are paid for either by taking the discount of one-half of 1 per cent for settlement within ten days from date of invoices, or by voucher for the month's purchase, issued between the fifteenth and twenty-fifth of the succeeding month. Manifestly the buyers who wish to take advantage of the cash discount or who prefer to settle their monthly bills as above stated would object devidedly to giving acceptances against purchases. The only use that acceptances would have would be in case the time for payment was lengthened, and this would increase the amount of credit given by the seller without any material benefit to the trade.

The present 30-day terms have developed by a process of evolution from the longer time formerly given. We would very much deprecate going back to the former terms, and we believe that the great body of dealers in iron and steel would prefer to retain the present policy.

What is needed in our judgment is that the federal reserve banking system should adapt itself to the methods of doing business in this country, rather than attempt to compel us to adopt the antiquated systems that are prevalent in foreign countries. According to the terms of the law as defined by the orders of federal reserve board, the definition of commercial paper is so narrow as to make its rediscount largely impracticable. The requirement that no paper issued for permanent improvements may be rediscounted, and that officers of the bank asking for a rediscount must certify that they know that the paper issued has not been for permanent improvement is absurd.

Strictly interpreted, the manufacturer of engines, machinery, electrical equipment, etc., cannot extend credit or take notes for such equipment unless it is strictly for repairs, though the parties buying such equipment expect to pay for it out of current receipts. It is very clear that the paper issued by some manufacturers, even though it were for permanent investment might be very much better from a banker's standpoint than the paper issued by other people for current expenses. If the paper is good and will be taken care of at maturity, it should make no difference to the federal reserve board whether the proceeds are used for current expenses and supplies, or for permanent investment.

In those branches of business where long time is still the rule, the use of acceptances may be found to be an advantage, and in the iron and steel business when for any reason it is deemed desirable to extend the terms of payment, it might be an advantage to require acceptances, but we do not think it wise to change materially our present methods of doing business.

Hopes to Resume Dividends Soon

With total earnings of $10,933,170 and with only $698,637, available for dividends, or the poorest quarterly statement in the history of the Corporation, the directors of the United States Steel Corporation at a meeting held at New York on Jan. 26, decided to pass the dividend on the common stock after reviewing the results of operations for the final quarter of 1914. The Steel Corporation failed by $5,606,283 to earn its preferred dividend and the deficit for the quarter just passed is represented by that amount, which was provided for the undivided surplus. The December net earnings of $2,554,249, set the low mark of the quarter and have perhaps never been so poor for a single month. The preferred dividend is payable Feb. 27 to holders of record Feb. 1.

In announcing their action, the directors made the following statement: "The earnings for the last quarter of 1914 were so small the board of directors, after careful consideration, reluctantly decided to suspend, for the present, the payment of dividends on the common stock. Business conditions are steadily, though slowly, improving, and it is hoped the resumption of dividends may not be long deferred."

The complete statement of the Steel Corporation for the fourth quarter, is as follows:

STATEMENT OF UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES

For the Quarter Ending Dec. 31, 1914.

EARNINGS.

		Earnings before int. sub. bonds.	Sub. Co.'s interest.	Balance.
Oct.,	1914...	$ 6,434,539	$ 854,006	$5,580,533
Nov.,	1914...	3,679,530	881,142	2,798,388
Dec.,	1914...	3,437,440	883,191	2,554,249
		$13,551,509	$2,618,339	
Total earnings				$10,933,170
Sink. funds on subsid. bonds depr., etc.		$3,027,444		
Sink. funds U. S. Steel bonds		1,560,468		
				4,587,912
Net income				$6,345,258
Int. U. S. Steel bonds..		$5,530,948		
Prem. on bonds		246,133		
				5,777,081
Balance				$ 568,177
Net balance sundry chr. and rec...				130,460
Balance				$ 698,637
Prfd. dividend				6,304,920
Deficit for quarter				$5,606,283

Trend Upward

General business news during the past week has been favorable, and although there were some irregularities, the general trend of industrial stocks was upward. Among the stocks making gains were the following: American Brake Shoe & Foundry preferred, ½; Bethlehem Steel preferred, 5¼; Colorado Fuel & Iron, 2; General Electric Co., ¼; Pittsburgh Coal preferred 1; Pullman Palace Car, 2¼; Railway Steel Spring, ½; Republic Iron & Steel, 2¼; Republic Iron & Steel preferred, 1⅞; Sloss, Sheffield Steel & Iron, ¾; United States Cast Iron Pipe & Foundry, ¾; United States Cast Iron Pipe & Foundry preferred, 5; United States Steel, ¾. American Locomotive common declined ½ point, as did also the Baldwin Locomotive common, while Baldwin Locomotive preferred declined 1½. Pressed Steel Car common lost 2¼, but the preferred advanced ¾ of a point.

Cambria Dividend

A second scrip dividend of 1¼ per cent covering the last quarter of 1914 and payable Feb. 15, to holders of record Jan. 30, has been declared by the Cambria Steel Co. The scrip is redeemable in cash at the end of two years with interest at 5 per cent. The directors of the company issued the following official statement regarding their action:

"The earnings upon the capital stock of the company for the year 1914 were 4.36 per cent, as against 13.8 per cent in 1913. Owing to the large surplus as well as the improved outlook for business the board of directors has declared the regular quarterly dividend of 1¼ per cent, payable Feb. 15, making a total of 5 per cent for the year.

"The company made large expenditures for improvements and increase in inventory during 1914, and in order to conserve its cash the dividend was declared payable in scrip redeemable in two years, bearing 5 per cent interest, payable annually."

Gold Pool Dissolved

New York, Jan. 25.—The necessity for which it was created having passed the $100,000,000 gold pool established by bankers in this country last fall to meet pressing obligations abroad, was formally dissolved at New York, Jan. 22. Of the total amount of the fund pledged by various banks, only 25 per cent was paid in. About $10,000,000 was shipped to Ottawa for the account of the Bank of England and the balance has been returned to the subscribers.

The dissolution of the pool reflects the easy condition of foreign exchange at this time. Recently demand sterling dropped to 4.83⅜, the lowest in eight years, and it continues well below the importing point, so that shipments of gold have been received in this country from Canada, China, Japan and England.

Steady Gain

Being Made by Corporation and Plant Operations Increasing

New York, Jan. 27. (By wire.)—The extraordinarily poor operations of the United States Steel Corporation in November and December, as reflected by the quarterly statement, seem to have represented the situation at its very worst. as ground continues to be steadily gained. Shipments for November and December, when operations averaged about 27 per cent, were the smallest in the history of the Corporation. Now operations are up to 50 per cent and increasing so that 60 is promised in the near future. Four additional blast furnaces have been ordered in, including two at Pittsburgh, one at Lorain and one at Gary. This is in addition to four put on last week.

Bookings this month are still ahead of shipments and unfilled tonnage will show an increase at the end. Good offers of steel are being made by England and the Ensley mill takes 8,000 tons of billets for export. The total structural work at Cristobal, upon which the Corporation is low, amounts to 8,900 tons.

Determined

To Force Passage of Ship Purchase Bill This Session

Washington, Jan. 27. (By wire.)—Determined to jam the ship purchase bill through at this session, if possible, Senator Kern, majority leader, gave notice that, beginning today, night sessions are to be held, and, if necessary, be continued without interruption until 10 o'clock at night and after today may begin at 10 in the morning. Democrats expressed confidence that they will be able to pass the bill and Republicans are inclined to think the measure can be passed. Senator Smoot, who has said it could not be passed before March 4, yesterday predicted there would be no extra session. Belief prevails that the bill will pass within two weeks.

Majority Leader Underwood says the bill can be passed promptly in the house, although there is some doubt as to this. Democrats say they will get Republican votes in the senate while not more than three Democrats will oppose the bill. Senator Gallinger today resumed the attack on the bill.

Democratic members say the commerce commission has approved all amendments agreed upon in caucus, including one admitting to participation in coastwise trade vessels owned by Americans and operated by shipping corporations, if built in this country.

Western Roads

Add 20,000 to Rail Tonnage Placed—Orders From Abroad

New York, Jan. 27. (By wire.)—Western roads have been coming out more freely for rails the past few days. The Chicago & Eastern Illinois yesterday bought 15,000, the Union Pacific took 10,000 and the Burlington 5,000 additional, making total orders 20,000. All these went to Chicago mills. The St. Paul & Northwestern is also out for a good tonnage. The Boston & Maine is understood to have distributed 15,000 tons with eastern mills.

The Chilean government railways take 10,000 tons from the Corporation despite contrary reports. The Russian order is still pending. The French government railways are inquiring for rails. The Interborough asks 5,000 tons of rails.

As a result of better buying in the west, the Gary mill resumes with two months' rolling ahead. Brisk buying of track accessories is also being done by western roads.

Discuss Wages

Pittsburgh, Jan. 27. (By wire.)—Representatives of sheet and tin plate mills controlled by the Amalgamated Association are conferring with officers of that organization today at the Fort Pitt hotel in an attempt to readjust the 1914 and 1915 wage scale. Employers have asked the Amalgamated Association to reduce the wage rate, contending that many of the so-called non-union mills already have cut wages. The Amalgamated Association scale as signed by the manufacturers last summer will not expire until June 30, and officers are opposed to making any change in the schedule.

Metal Markets

New York, Jan. 26.

Practically all the non-ferrous metals have displayed a marked upward tendency in prices during the week. This especially is the case in spelter, in which market there has been a great deal of excitement. Due to the recent large sales to Europe, producers are well sold up and a good many have withdrawn from the market entirely, with the result there has been a scramble on the part of consumers, particularly the galvanizers, for supplies over the next few months. Very few producers are quoting at all; others are offering limited tonnages of prime western for prompt shipment at 7.12½c to 7.25c, St. Louis. No producers, as far as known, are making any offers whatever on futures. In the meantime, both foreign and domestic inquiry continues of large proportions.

More Receivers

Are Appointed as Result of Failure of J. V. Thompson

Pittsburgh, Jan. 26.—The common pleas court of Fayette county, Pennsylvania, has been busy since Jan. 18, when the First National bank of Uniontown was closed by order of the board of directors, appointing receivers for individuals directly or indirectly connected with J. V. Thompson, president of the bank. One coke producing concern, the Tower-Hill Connellsville Coke Co., is included in the receivership list.

Receivers have been appointed for the following, as a result of the culmination of long standing troubles in the Uniontown district:

J. V. Thompson, president of the First National Bank of Uniontown; assets, $70,000,000; liabilities, $22,000,000. I. W. Semans, an associate of Mr. Thompson; assets, $8,000,000; liabilities, $2,800,000. Tower-Hill Connellsville Coke Co.; assets, $3,500,000; liabililties, $3,000,000. Tower Hill Supply Co.; assets, $120,000; liabilities, $40,000. Frank H. Rosboro; assets, $300,000; liabilities, $90,000. Oliver P. Markle and Isadore Frank, real estate men; assets, $1,357,000; liabilities, $496,000. Palmer-Semans Lumber Co.; assets, $320,000; liabilities, $180,000. William M. Thompson, brother of J. V. Thompson; assets, $1,250,000; liabilities, $180,000. Jasper Augustine, broker and capitalist; assets, $1,168,000; liabilities, $102,000. Despite the uncertainty caused by the existing conditions at Uniontown, the market for Connellsville coke has not been affected, and probably will not suffer serious effects, according to close observers.

More Labor Leaders Indicted

Chicago, Jan. 27. (By wire.)—The federal grand jury Tuesday indicted four more union business agents for obstructing commerce, Mike Norris and John Haley, business agents of the lime, stone and cement teamsters' union; John Miller, coal teamsters' union, and John Lynch, excavating teamsters' union. The offense occurred Jan. 24 after the alleged demand for black mail on the McLaughlin Building Materials Co. for $5,000. Five previous indictments have been returned in other cases.

Death of A. G. Hathaway

A. G. Hathaway, Cleveland representative of David Lupton's Sons Co., Philadelphia, manufacturer of steel window sashes, died Jan. 25, from paralysis. Mr. Hathaway was born in Philadelphia and had been in business in Cleveland nearly 30 years.

Buffalo Electric Steel Foundry

Details of Method of Operating Large Electric Furnace, Cost of Output, With Description of an Interesting Foundry

BY H COLE ESTEP

CONSIDERABLE interest is attached to the new foundry of the Otis Elevator Co., at Buffalo, because it represents a serious attempt to make electric steel castings on a scale comparable with open-hearth practice. The foundry now has been in operation about six months and the results so far obtained from the electric furnace are satisfactory both as regards quality of product and cost of production. The cost of the electric furnace metal is particularly low because no difficulty has been experienced in melting machine shop borings and turnings which have a market value at present of only $5.50 to $6.00 per gross ton, f. o. b. Buffalo. In this and other respects the furnace has an advantage over open-hearth melting. The new foundry, which is operated in connection with the Buffalo plant of the Otis Elevator Co., produces both gray iron and steel castings. The output includes castings that are necessary for the manufacture of freight and passenger elevator parts, such as motor frames, sheaves, sheave brackets, gear cases, cylinders, etc. The cupola in the gray iron department has a melting capacity of from seven to nine tons per hour and the plant is arranged for a capacity of 20 tons of gray iron castings per day. The steel department has a maximum capacity of approximately 20 tons a day. The building is 100 feet in width and 400 feet in length, one story high, with a basement under one end, 100 x 125 feet. The total floor space is 67,692 square feet.

The electric furnace was furnished by the Metallurgic Engineering Co., Chicago, and is rated at three tons capacity. It is installed near the middle of the shop, as indicated in Fig. 10. Ample working space has been allowed on all sides of the furnace. The furnace is of the standard Snyder tilting type and is equipped with a single 6-inch graphite electrode. It uses single-phase current and its general arrangement is indicated in the accompanying illustrations. The shell is riveted steel plate and the furnace is lined with silica brick. The bottom is made with silica sand and the roof consists of silica brick specially made to form a self-supporting dome. The roof has an average life of 150 to 175 heats, and therefore it is carried in a removable cast steel ring. Two spare roofs are kept on hand and the change can be made in a few hours. This work is usually done on Sunday, so that no producing time is lost to the foundry. There are two charging doors, one on each side, of the breech block type, as indicated in Fig. 3. The electric current is led to the furnace through a graphite electrode, 6 inches in diameter, which enters on the top. The electrode is adjusted by a rack and pinion gear at the back of the furnace, as shown in Fig. 3. The bath of metal forms the opposite pole, connection being made with the outside circuit through a steel contact inserted in the bottom of the furnace. A wattmeter mounted at the rear of the furnace is always in circuit and shows the power being consumed. The tilting mechanism, which is entirely beneath the floor, is of the customary rack and pinion type. It is driven by a five-horsepower General Electric induction motor. The tilting motor is actuated by an ordinary railway type controller placed behind a steel plate screen in front of the spout of the furnace. A concrete ladle pit has been excavated in front of the furnace to receive the ladle when pouring. The working space around the furnace is paved with wood blocks furnished by the Ayer & Lord Tie Co., Chicago. The electrical energy is furnished by the Cataract Power & Conduit Co., of Buffalo, the current being generated at Niagara Falls. It is delivered to the foundry at 2,200 volts, 3-phase, 25 cycles. In a subway behind the furnace two transformers are installed. They are Scott connected and supply the furnace with single-phase current at 220 volts. Suitable switches, me-

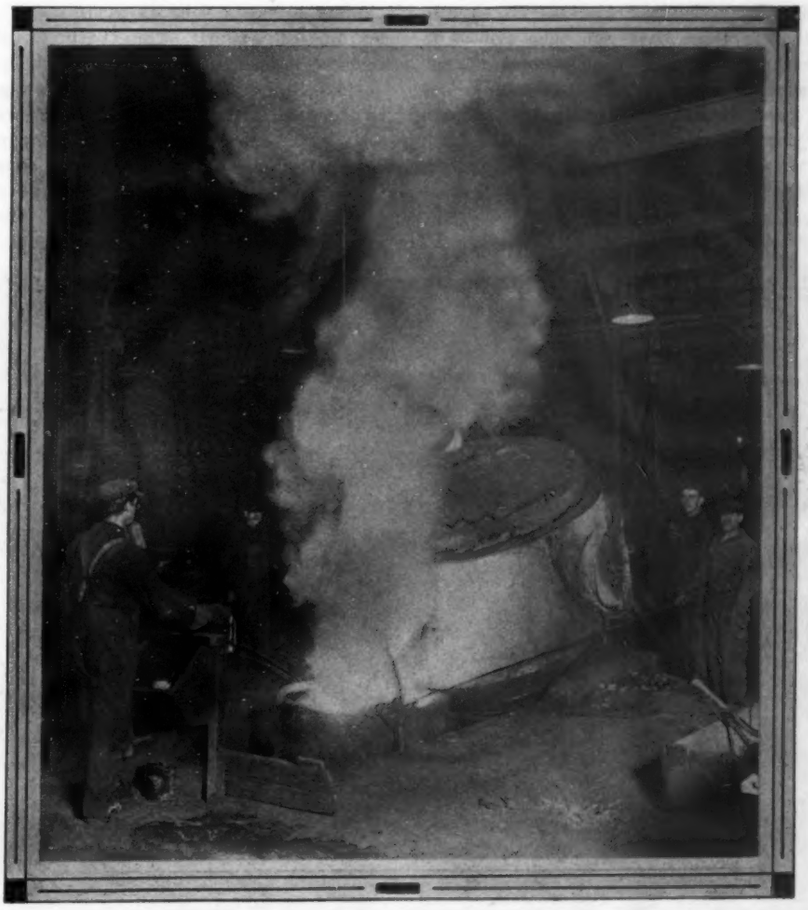

FIG. 1—POURING FROM THE ELECTRIC FURNACE AT BUFFALO PLANT OF OTIS ELEVATOR CO.

FIG. 2—ELECTRIC FURNACE SHOWING SPOON AND TACKLE USED TO CHARGE HEAVY PIECES

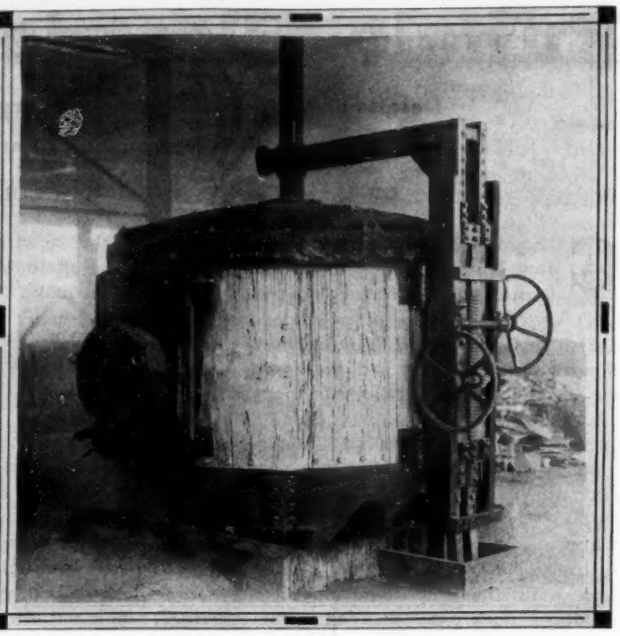

FIG. 3—REAR OF ELECTRIC FURNACE SHOWING MECHANISM FOR CONTROLLING ELECTRODE

ters and a reactance coil also are provided. Due to the energy losses in the coil and between the transformer and the furnace, the potential at the arc is about 195 volts. The furnace normally consumes 655 kilowatt-hours for a little less than two hours in melting a two-ton heat. The electrode cost is stated to be less than 70 cents per ton of steel and the refractories and repair cost less than 60 cents.

In order to reduce the cost of electricity arrangements were made with the power company to use the current only at night from 7 p. m. to 6 a. m. The molding, therefore, is all done in the day time, and a special gang comes on duty at 6:30 p. m. to operate the furnace and to take off the heats. This gang consists of 11 men, including a melter, who also acts as foreman, an electrician, a crane operator and eight laborers. This crew not only does all the work incident to charging the furnace, slagging off and pouring the heats, but it also shakes out the castings and cleans up both the steel and iron floors ready for the day gang. At the present time, four heats are taken off every night, aggregating nine tons in weight. Usually it requires about 2½ hours to melt the first heat, when the furnace is comparatively cold, the remaining heats being melted in somewhat less than two hours each.

The charge consists entirely of machine shop turnings and the heads, risers and returned scrap from the foundry. The proportions are 70 per cent turnings and 30 per cent returned scrap. The foundry scrap consists of fairly heavy pieces but the turnings, of course, are finely divided. The turnings have been allowed to lie out in the weather, and

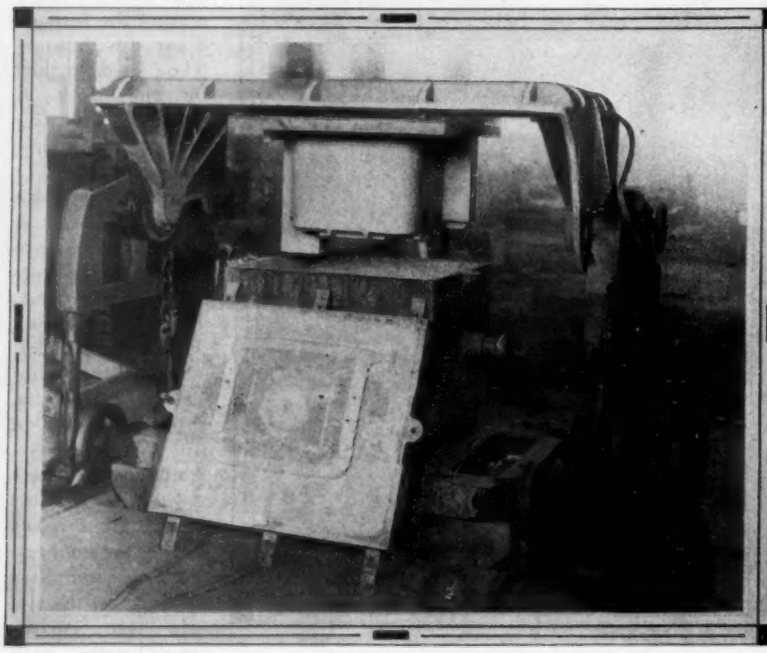

FIG. 4—ROLL-OVER JOLT MACHINE RIGGED TO MOLD MOTOR FRAMES

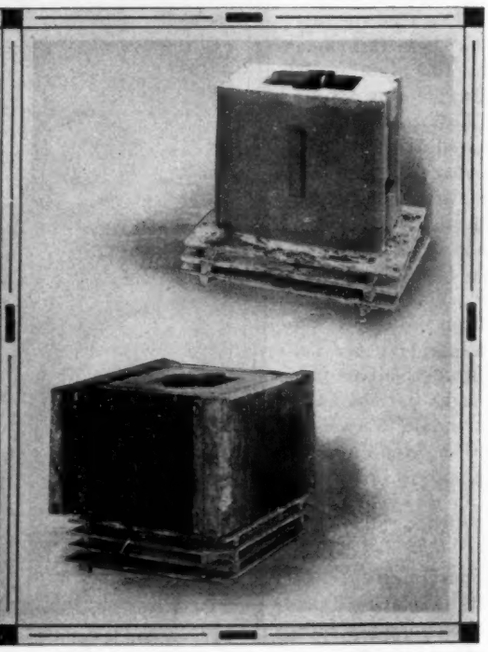

FIG. 5—CORES FOR MOTOR FRAME

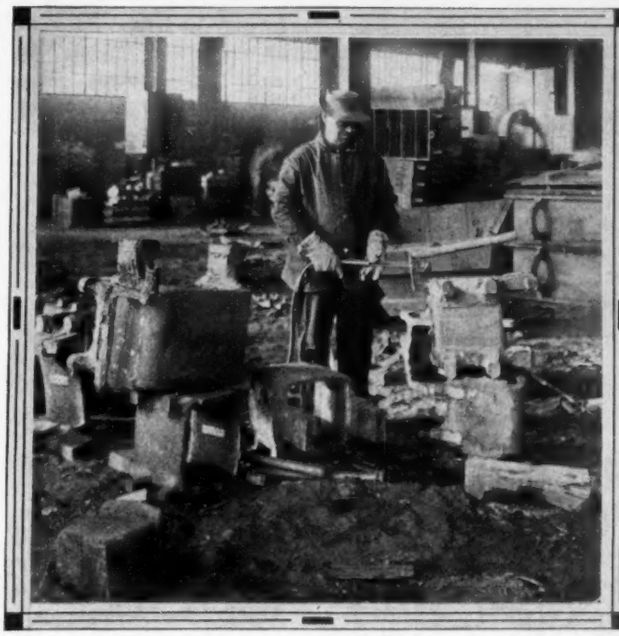

FIG. 6—CUTTING RISERS AND HEADS OFF MOTOR FRAME CASTING WITH OXY-ACETYLENE FLAME

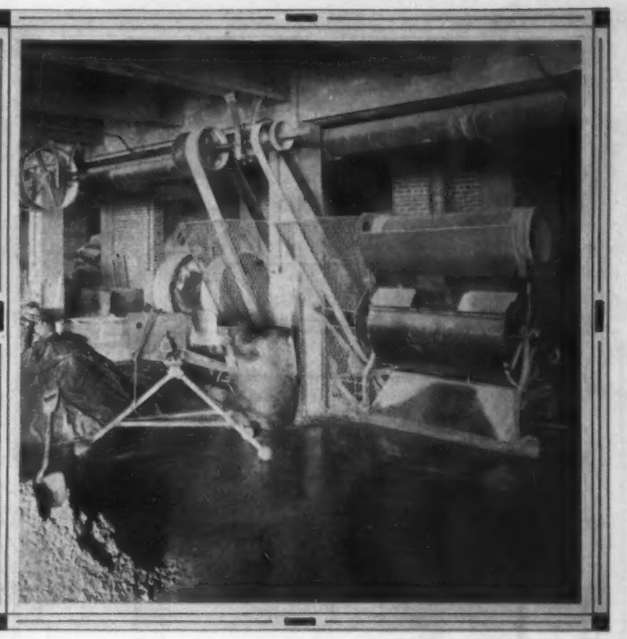

FIG. 7—SAND MIXING DEPARTMENT

for this reason have accumulated a heavy coating of rust, which is reduced by charging charcoal with the metal.

The heads, risers and heavy pieces are charged first, using the long handled spoon shown in Fig. 2. The spoon is suspended from a light monorail by chain tackle as indicated in the illustration. The turnings are charged on top of the heavy pieces, the furnace being filled up to and even above the charging door.

With the charge of scrap in the furnace, the switches are closed and the electrode is lowered until the arc jumps and a circuit is established. The position of the electrode during the melting process is regulated by referring to the wattmeter which shows the amount of power being consumed. When starting up cold, the melter usually stands by the hand-wheel for ten minutes regulating the arc to the full capacity of the furnace as the charge melts down. He then throws in a ratchet and the furnace regulates itself to the end of the heat. The bath is handled practically as in standard open-hearth practice. The scrap is carefully analyzed and the charges are proportioned to produce the quality of steel desired. Near the end of the heat, alloys, ferro-silicon or ferro-manganese, are added as in ordinary practice to "kill" the steel and to bring the analysis up to the required figures.

It is customary to pour test bars during the progress of the heat, although the operator soon learns from

FIG. 8—A PORTION OF MOLDING FLOOR SHOWING HATCHWAYS AND CHUTES LEADING TO BASEMENT

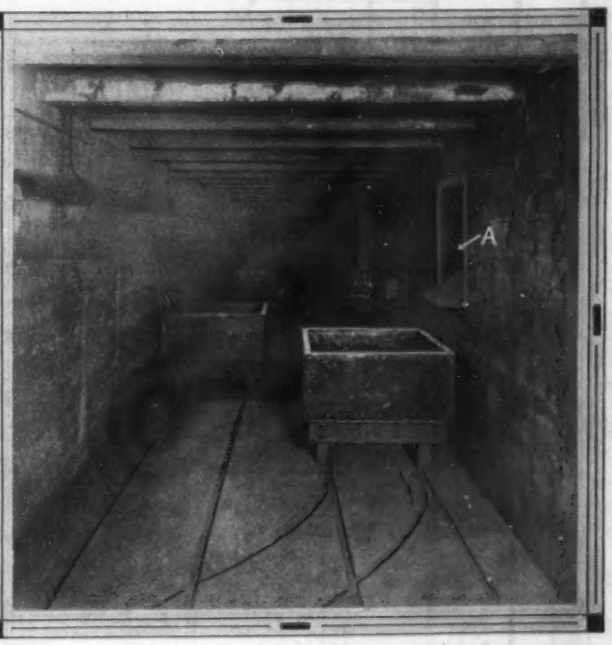

FIG. 9—SUBWAY UNDER MOLDING FLOOR

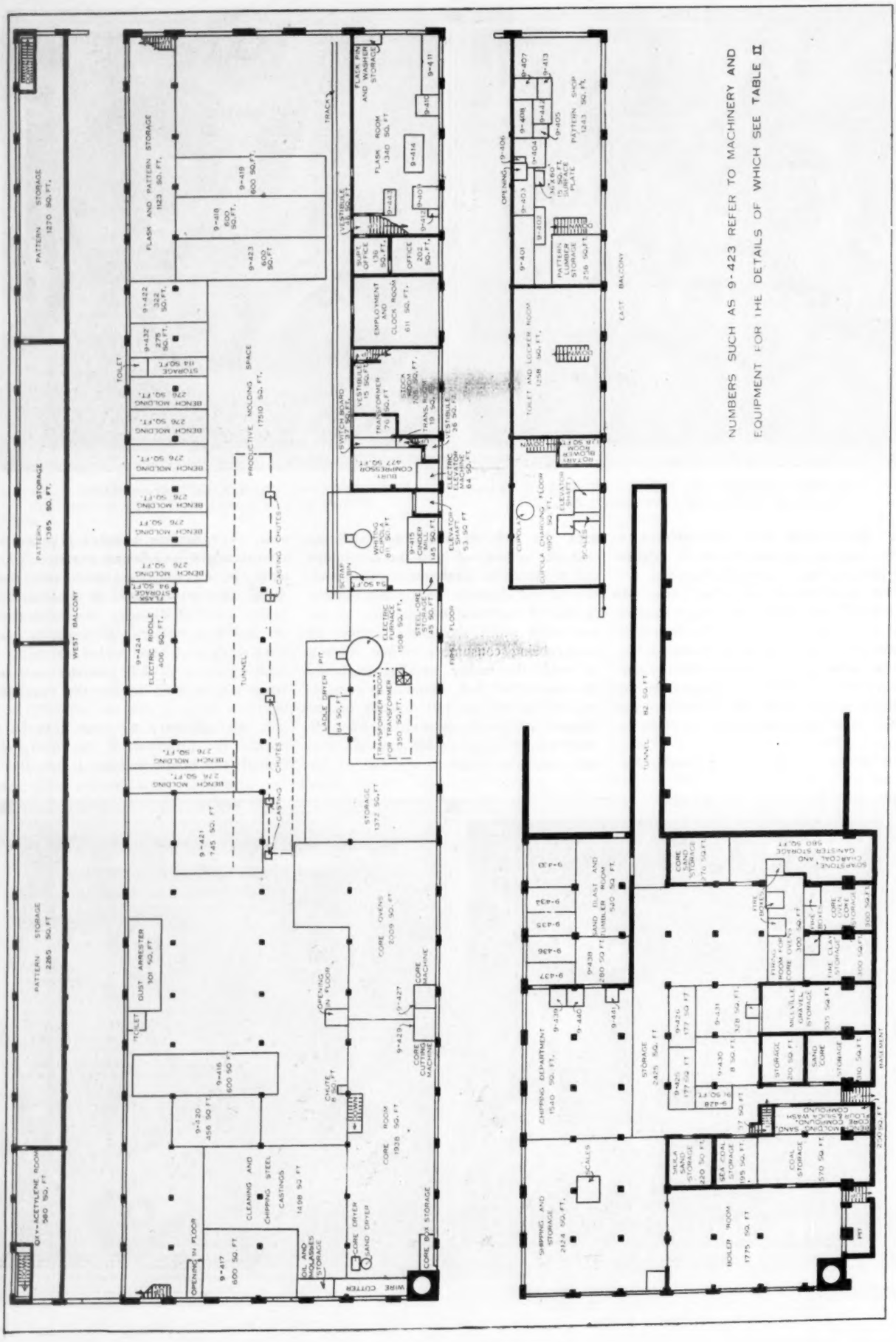

FIG. 10—PLAN OF OTIS ELEVATOR CO.'S FOUNDRY AT BUFFALO

experience how to judge the composition of the steel from its consistency, color, etc., in the furnace. Typical analyses of the cast metal from the electric furnace are as follows:

	Motor frame castings. Per cent.	Machinery castings. Per cent.
Silicon	0.45 to 0.50	0.35 to 0.40
Manganese	0.10	0.40 to 0.450
Phosphorus	0.075	0.075
Sulphur	0.050	0.05
Combined carbon	0.18 to 0.20	0.18 to 0.20

The slag is made rather sticky and is drawn out of the charging doors before pouring with iron rabble hooks. If necessary, the slag is thickened by throwing molding sand into the furnace near the end of the heat.

When the bath is ready for casting, the melter takes his position at the controller located in front of the furnace and tilts the furnace so as to pour the molten steel into the crane ladle which has been lowered into the pit. It is a simple matter to control the pouring operation and requires only a cool head and a little practice in handling the controller. The ladles are of the usual bottom pour type found in steel foundries and have sufficient capacity to hold the molten steel from a 2½-ton heat.

Table I.

FLOOR SPACE.

The following figures give the floor area in detail:

	Square feet.
Entire floor space of floor	40,860
Entire floor space of east balcony.	4,782
Entire floor space of west balcony.	5,650
Entire floor space of basement	16,050
Transformer room	350
Total floor space	67,692

The bottom contact is a steel casting which carries the current through the lining. The lower end of it is water cooled in order to protect the copper connections, but the upper end is solid and melts off flush with the lining. When the steel has been poured and the furnace cooled a trifle, a steel plug, or "button," is placed in the bottom of the furnace to displace the slag over the contact. It is said no operating trouble has been caused by this contact. Repairs to the bottom are made as in ordinary open-hearth practice. A contract has been let for the installation of a second furnace of the same capacity as the one described above.

In addition to the electric furnace, the Buffalo plant of the Otis Elevator Co. contains many interesting features. The general arrangement of the building, indicating the relation between the steel and gray iron departments, is shown in Fig. 10. One end of the shop is used for gray iron and the other for steel molding, the melting and core making equipment being arranged along the side as shown in Fig. 10.

A basement with a floor area of 16,050 square feet, provides ample space for sand handling and cleaning equipment. As shown in Fig. 10, a tunnel extends from one end of the basement under the molding floor. Tracks have been laid in the tunnel on which small industrial cars are operated. Fig. 9 shows a view in the tunnel. The cars may be lifted out of the tunnel by the cranes in the foundry through a hatchway at one end. It is customary, therefore, for the car to be placed anywhere on the floor that may be convenient and when filled with castings, it is picked up by the crane and dropped into the tunnel from which it is switched out to the cleaning room. Five spiral casting chutes are also provided and castings which are not liable to breakage may be dropped through these chutes into cars waiting below as indicated at *A* in Fig. 9.

The sand bins which are in the basement may also be filled from the molding floor through chutes similar to that shown at *C*, Fig. 8. The sand bins also may be filled from railroad cars standing on the tracks in the yard outside the building.

The equipment in the sand mixing department, Fig. 7, includes a Blystone mixer, several Hanna electric riddles and two grinding mills which were built by the Otis Elevator Co. This equipment is placed in close proximity to the sand bins. The sand is distributed throughout the foundry in buckets which are handled by the traveling cranes indicated in Fig. 8. This illustration shows a bucket of sand being hoisted through the hatchway which connects the molding floor with the sand room below.

The crane equipment is unusually complete. The main bay is served by a 10-ton Shaw crane. In the steel molding end of the shop, the work of the 10-ton crane is supplemented by two 5-ton Shaw cranes which operate on

Table II.

DETAILS OF EQUIPMENT IN FOUNDRY OF OTIS ELEVATOR CO.

Tool No.	Name of tool.	Average power per month in K. W. hours.	Sq. Ft. of floor space occupied.	Average air used per month in K. W. Hours.
9-401	Planer, 24-inch to 26-inch	200	143	25
9-402	Hand planer and jointer	166	38	25
9-403	Universal rip saw	100	80	25
9-404	Band saw	80	84	25
9-405	No. 3 Oliver wood trimmer	120	24	25
9-406	Double emery wheel grinder	95	7	25
9-407	Gardner Disc grinder	80	53	25
9-408	Pattern maker's lathe	111	72	25
9-409	36-inch band saw	80	62	25
9-410	Rip saw	100	56	25
9-411	Swing saw	80	108	25
9-412	Double emery wheel grinder	95	10	25
9-413	Drill press	80	32	25
9-414	Hand planer and jointer, 316-C-16	126	72	25
9-415	32 x 54-inch No. 3 water cinder mill	250	145	25
9-416	18-inch Pridmore molding machine	...	600	..
9-417	Newton cold cut-off saw	...	600	..
9-418	24-inch Tabor roll-over molding mach.	...	600	300
9-419	24-inch Tabor roll-over molding mach.	...	600	300
9-420	No. 2 combination jar ram roll-over pattern drawing swing-out molding machine	...	456	400
9-421	No. 406 Osborn direct draw roll-over jolt machine	...	745	600
9-422	13-inch plain power squeezer	...	322	300
9-423	30-inch hand roll-over machine	...	600	200
9-424	Hanna electric riddle with 110-volt motor	53	406	25
9-425	Hanna electric riddle with 110-volt motor	53	177	25
9-426	Hanna electric riddle with 110-volt motor	53	177	25
9-427	⅜ to 4½-inch stock core machine, Wadsworth	150	51	25
9-428	Blystone sand mixer and screen	400	91	25
9-429	No. 3 core cutting machine	150	74	25
9-430	60-inch sand grinder	800	328	25
9-431	60-inch sand grinder	800	328	25
9-432	Small sheave core machine	...	275	200
9-433	36 x 60-in. tumbling mill	158	225	25
9-434	30 x 54-in. tumbling mill } Central	148.5	124	25
9-435	24 x 42-in. tumbling mill } Iron	140	124	25
9-436	24 x 42-in. tumbling mill } Works	120	124	25
9-437	20 x 42-in. tumbling mill	110	124	25
9-438	Sand blast machine, Hoevel	135	280	1,000
9-439	Valley City grinder	250	33	25
9-440	Valley City grinder	250	33	25
9-441	Double emery wheel grinder	145	20	25
9-442	18-inch pattern maker's lathe	...	50	..
9-443	Drill press	...	32	..
	10-ton Shaw A. C. crane	976	...	20
	5-ton Shaw A. C. crane	538	...	20
	5-ton Shaw A. C. crane	538	...	20
	Dust arrester	400	301	20
	Electric elevator machine	380	175	20
	Wilbraham-Green rotary blower	520	128	..
	Whiting cupola	...	834	800
	Electric furnace	64,000	858	300
	Bury air compressor	7,000	477	..
	Oxy-acetylene generating	3,250	580	25
	Six bench vibrators	...	...	600
	Two air hammers	...	...	800

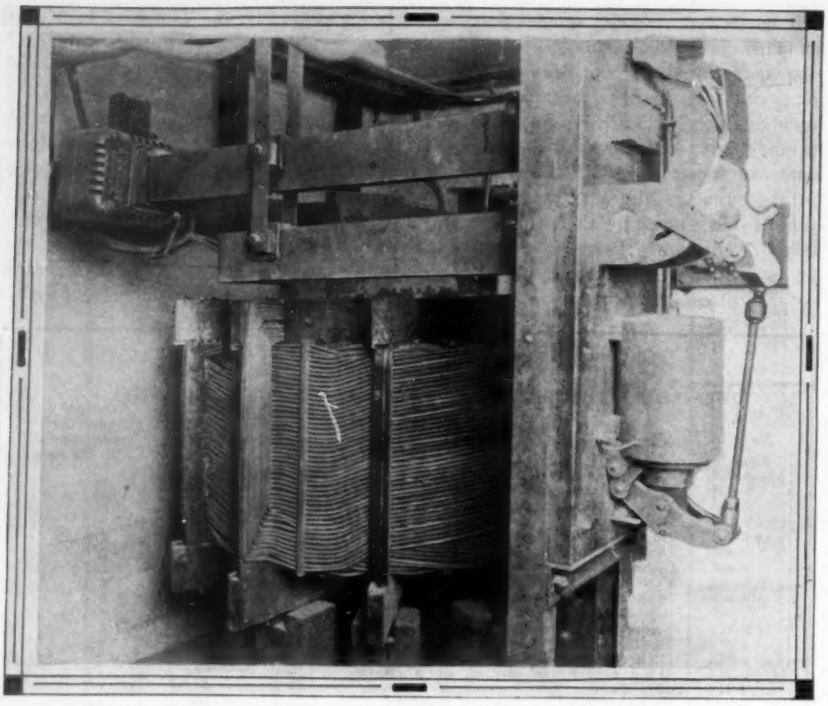

FIG. 11—REACTANCE COIL IN CIRCUIT WITH ELECTRIC FURNACE

parallel runways. The bench molders' stations along the wall opposite the electric furnace and cupola are served by a 1-ton floor controlled crane. A 7½-ton Shaw gantry crane has been installed in the yard for handling pig iron, coke, scrap, castings, etc.

In most respects the molding practice is standard. Figs. 4, 5 and 6 show how motor frames are molded, using an Osborn direct draw, roll-over jolt machine. The flasks are cast iron, 30 inches square, the drag being 24 inches and the cope 6 inches deep. After the mold has been rammed and rolled over, the drag is deposited on the transfer car connected with the machine as shown in Fig. 4, and the pattern is drawn. Fig. 4 shows the drag just after the pattern has left the sand. The cope is rammed by hand. Two men, a molder and a helper, operate the machine. The castings are made in several sizes, the one shown in the illustration weighing 800 pounds finished.

The cores, which are hollow, are made in dry sand. A finished core is shown at the right in Fig. 5; at the left in the same illustration, the core is shown as it appears just before the box is removed.

The motor frame castings are poured through a bottom flow gate and are provided with two shrink heads as shown in Fig. 6. This illustration also shows how the oxy-acetylene torch is used for cutting off heads and risers. The castings are cleaned by being tumbled in a mill.

The cupola for melting gray iron is situated alongside the electric furnace. It was furnished by the Whiting Foundry Equipment Co., Harvey, Ill., and is lined to 60 inches inside diameter. The blast is furnished by a Wilbraham-Green standard cupola blower direct connected to a 25-horsepower General Electric motor which runs 750 revolutions per minute. For recovering the iron in the cupola drop, a cinder mill manufactured by the Central Iron Works, Quincy, Ill., has been installed. The charging floor, which is arranged in the usual manner, has 990 square feet of working space. It is provided with suitable scales and is served by an elevator manufactured by the Otis Elevator Co. Ordinary gray iron machinery mixtures are melted, ranging from 2.25 per cent to 2.5 per cent silicon. The analytical work is handled through the Toronto office of the Charles C. Kawin Co.

The core room, which is situated in one corner of the shop, has a floor space of 1,938 square feet. It is equipped in the usual manner, including Wadsworth core making and cutting machines. The drying equipment includes four car type ovens, Fig. 8, and four five-drawer shelf type ovens. The ovens are fired with coke from the basement.

The general arrangement of the cleaning department in the basement is shown in Fig. 10. The equipment includes five tumbling mills furnished by the Central Iron Works, Quincy, Ill., ranging in size from 20 x 42 inch to 36 x 60 inch, together with a rotary automatic type Hoevel sand blast machine, grinders, etc. Compressed air is utilized for chipping. Before being shipped the castings are weighed on a Springfield automatic scale which is installed in the cleaning department. It has a capacity of 10,000 pounds.

The pattern shop which is situated on a mezzanine floor, as indicated in Fig. 10, has an area of 1,243 square feet. It is provided with the customary equipment, including ten patternmakers' benches. The tools are completely equipped with guards for the prevention of accidents.

One end of the pattern gallery is set aside for the equipment used in generating oxygen and acetylene for welding and cutting purposes. This equipment was furnished by the Davis-Bournonville Co., New York. The oxygen is manufactured electrolytically, using a 25-kilowatt motor-generator set.

Special attention has been given to the comfort of the workmen. The building is heated by steam generated in two 72-inch by 18-foot return tubular boilers built by the Springfield Boiler & Mfg. Co., Springfield, Ill.

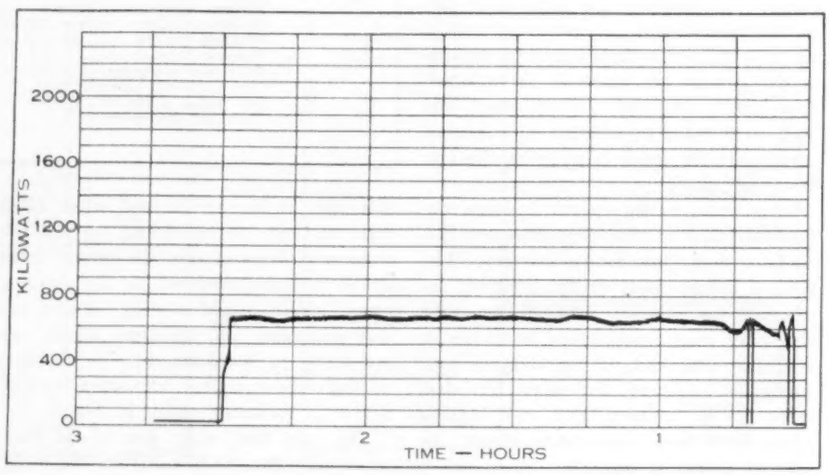

FIG. 12—ELECTRIC FURNACE LOAD CURVE FOR ONE HEAT

Malleable Iron for Automobiles

A Contribution on the Suitability of Malleable Castings for Motor Cars, With Discussion by Enrique Touceda

BY DR. RICHARD MOLDENKE

THE REMARKABLE expansion of the steel casting industry in recent years, accompanied by the establishment of manufacturing facilities far in excess of the legitimate demand, has resulted in taking away from the gray iron and malleable casting plants much work, for which there was no excuse other than desperate price-cutting. In self-defense the malleable founder reached out for new lines, and the automobile industry with its enormous demand for material along lines of quantity production and repetition work replaced a fair percentage of the casting losses above referred to. Unfortunately, however, the relief has not been sufficient to allow the three great lines of casting manufacturers to readjust costs with receipts. The automobile manufacturer cannot expect and does not get the highest quality of malleable castings possible to obtain, as his requirements do not harmonize with the best possibilities of the metal in question, and the financial necessities of the producers mean bids for work which leave no margin for running heats specially adapted to the comparatively heavy sections to be cast.

It is the purpose of this paper to discuss the qualities of malleable castings of special interest to the manufacturer of automobiles, to describe enough of the process to show how these qualities can best be obtained, and finally to draw whatever conclusions may seem pertinent.

The position occupied by the "malleable casting" in the iron industry is a unique one. Its value in commerce depends entirely upon the effect of a drastic and carefully applied heat treatment given white iron castings which would otherwise be unserviceable. Its status is somewhere between that of the gray iron and the steel casting. It is stronger than the gray iron casting, can be bent and twisted somewhat, and has as its most valuable characteristic a resistance to shock often applied, being ahead of the steel casting in this respect. On the other hand, the malleable casting is weaker than the steel one under a direct pull, which is the principal reason the latter has replaced it for the heavier grades of work. Since in automobile work resistance to shock is most essential, the points in the manufacture of malleable castings bearing specifically upon this property should be given special attention.

As stated previously the process begins with the making of white iron castings. This material, if of proper composition and melted right, is the only one that will stand the application of very high temperatures, long continued, without damage. A gray iron, given the same heat treatment, will come out of the "anneal" utterly ruined. A mottled iron, white iron just beginning to shade into the gray, will also come out from the anneal of very poor quality. Hence the importance of so calculating the mixtures that the casting will leave the sand white in fracture. As this is a function of the composition (principally the silicon content), the temperature of pouring (to a slight extent) and the influence of the section thickness, it will be seen that there are great chances for trouble. Suppose the composition of the molten metal just tapped is perfect, the mere carrying of the ladles to a distant part of the shop may be sufficient to so cool it that heavier sectioned castings will come out gray in fracture, whereas right at the furnace, or poured piping hot, they will be white. Again, as between a silicon content of 0.45 per cent and another heat with this element at 0.75 per cent, the former will give white fractures in castings nearly up to ¾-inch thick, whereas the 0.75 per cent metal poured into the same castings will be gray. Both compositions, however, when cast into thin work will give white iron. As to the physical properties in these two cases after annealing, it may be said that the 0.75 per cent silicon metal in thin castings, when the right kind of molding sand has been used, will give fine, smooth and nicely machining castings, of indifferent strength and shock resisting quality, but amply good for ordinary purposes. In thick castings, in which this metal comes from the sand gray in fracture, the effect of the annealing is to open up the structure still further, allow the oxygen to penetrate and attack the graphite somewhat, as well as the iron crystals, leave the fracture a dirty gray occasionally relieved by stripes of color such as seen in tempering steel, and as a consequence technically called "calico iron"; and in effect make a very weak and unserviceable metal, dangerous to life and limb, and altogether to be avoided at any cost. The 0.45 per cent silicon castings, after annealing, when in thick sections, will be of good strength—say up to 52,000 pounds per square inch if properly made—and everything that is desirable in malleable casting work, except that the skin appearance will not be as fine as with the higher silicon ranges, and the castings will not be as machinable, the tool tearing the surface somewhat, as it is of a steely nature. Similarly in thin sections, this low silicon metal is exceedingly strong, pliable and highly shock-resistant, but will not yield as fine a surface or machine as easily.

On the manufacturing side it may be said that running low silicon heats is no easy matter, for they are prone to run away and become so badly oxidized that the percentage of lost castings becomes astonishing. The iron eats into the mold surfaces, is gassy and hence leaves pinholes in the casting surfaces, and in annealing loses sharpness of line. However, it is first-class metal from the standpoint of the constructor. Since malleable castings made by the cupola process are inferior in quality anyhow, these would never be made except with the higher silicon ranges, and would be used for such articles as pipe fittings, hardware, etc. The better grades of malleable are made in the air furnace, or still better in the open-hearth furnace, where it is quite possible to get low silicon metal safely when the business of making it is thoroughly understood.

Between 0.45 per cent silicon metal—which is about the lowest safe point in good practice—up to 0.75 per cent silicon—which is the highest safe point for the light grades of ordinary work, very thin castings often running up to 1.25 per cent silicon satisfactorily—there is a range which each manufacturer tries to study with reference to the average class he makes. Thus, for railroad castings, as now required, a silicon

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of 0.65 per cent gives the most satisfactory results quality and cost of production combined. Were cost of product a secondary consideration, and high-grade work demanded, as it should be, the silicon should be dropped to 0.50 per cent and a higher price charged.

It is seen that the manufacturer of malleable castings has the power, if he has the ability, to so regulate his mixture and operate his melting process that he can produce a very high-grade material for automobile work, if the automobile manufacturer will on his side adapt the castings to be made to non-machining considerations, or if this may not be, arrange his machining to suit the metal produced. A glance at the constitution of the malleable castings will throw light on this matter. The average composition of the white iron as cast, 0.65 per cent silicon; sulphur, 0.06 per cent; manganese, 0.25 per cent; phosphorus, 0.175 per cent, and total carbon (all combined), 3 per cent, has a contraction (ordinarily called "shrinkage") of ¼-inch to the foot. This is the average, as actually some portions of the casting contract 5/16-inch and others nothing at all, depending upon the design, the temperature of pouring, etc. The skill of the pattern-maker comes into play here. Before undertaking a run in the shop single castings should be made, measured up to correct the pattern, and broken up to look for shrinkage spots to be corrected by the application of "chills".

With the well-known lack of fluidity of white iron, and the consequent very quick setting of the metal, particularly at the thin gates, it is a rare occurrence to get a perfectly sound malleable casting. The metal naturally sets first against the mold walls, giving sound metal there. Then it sets inwardly. If it were possible to feed fresh metal within, particularly with a contraction per foot twice as great as for gray iron, sound castings would be possible. As, however, the feeding is cut off so quickly in spite of the pouring method used for this work—which practically throws the metal into the mold—there will be planes of separation in the interior, at right angles to the surfaces, but not touching these, which make for an interior weakness. A glance at any broken piece of malleable will quickly show this.

The annealing process or heat treatment given the white iron casting is a procedure peculiar to the malleable industry. Properly carried out, it means raising the temperature of the containers carrying the castings packed in an oxide of iron, up to 1,350 degrees Fahr. at the coldest point in the oven. This means that the maximum is about 1,450 degrees Fahr., the oven itself running considerably higher. After the material has reached this temperature, it is held for at least 60 hours (good malleable can be made in less than 60 hours at full temperature, but it is so easy to obtain "under-annealed" material that all specifications wisely compel the 60-hour limit), and then allowed to cool as slowly as convenient.

The effect of the "anneal" is threefold. First, an expansion takes place which permanently restores half the contraction of the original white iron. Hence in effect patterns are made for malleable with the same "shrinkage" allowance as for gray iron. Here comes the necessity for not only a proper composition to allow this expansion to take place, as without the limits of the proper chemical composition it will not take place, but also a proper melting procedure. A badly melted heat will be so oxidized that in spite of the proper composition, other than the oxygen content, the metal will not anneal.

Second Effect of Annealing

The second effect, which goes on simultaneously with the first, is a conversion of the combined carbon of the hard white casting, into a peculiar form of amorphous graphite, called "temper-carbon" or occasionally referred to as "annealing carbon", the German word "tempern" meaning this. The change was first studied by the late Professor Ledebur. Observation of the fractures made by the writer for every six hours during the annealing period, indicates that the structure of the metal slowly opens and that between the several crystal groups there is a precipitation of this carbon (looking like lamp-black) which gradually increases until the shade of the fracture changes from silvery white to a velvet black. With this change comes that from a hard, brittle metal to a soft, pliable one, for the matrix is now a steel, the carbon being mechanically mixed, although not as in the case of gray iron.

Unless the metal can expand permanently to allow this deposition to take place, there will be no annealing effect. Moreover, this is a precipitation from and within a solid which is not crystalline graphite, as in gray iron, for on heating a piece of malleable to a very high point and quenching, the carbon is re-dissolved while in the solid state, and the resulting white fracture looks like that of a tool steel, not the original crystalline structure of the hard piece. Hence the necessity of straightening a malleable casting only when cold. The interesting point in connection with this carbon conversion is that not only is it the basis of the great increase in strength observed in malleable over gray iron, in which the carbon is crystalline, and hence very much more weakening through the starting of cracks in the metal when strained; but the manner of deposition of the temper-carbon and its nature are such that if a malleable casting is punished ever so much in service and battered out of semblance, as it were, this carbon acts like a cushion in preventing the spread of the damage, and the portions of the casting adjacent to the damaged parts will be found as sound as ever. In other castings, such as steel castings, it will be found that the adjacent material has been weakened by the opening up of the crystalline structure. Hence the great advantage of malleable castings under shock.

The third effect of the annealing process is the removal of some of the carbon from the surface portions of the castings. If a flat piece of malleable which has been made in the ordinary manner, with an oxide of iron packing in the annealing boxes, is put on the planer and successive thickness of metal taken off, and these analyzed for carbon, it will be found that while this is practically all temper-carbon, obtained chemically as graphite (with very little combined carbon remaining), the quantity will vary from very little at the skin to the full amount about ¼-inch inward. Therefore, at about ⅛-inch inward will be found a carbon content which, when the piece is heated and quenched as for steel, will be as hard as tool steel similarly treated. This reduction of total carbon in the skin of a casting—all malleable castings being of great surface compared with weight—naturally means an increase in strength of that portion over the interior. Accordingly, we have in the skin of a malleable casting not only a much sounder material, as explained in a previous paragraph, but also a stronger one. Hence also the suggestion to automobile engineers to so arrange their construction that a malleable casting gets a minimum of machining, particularly at points where strength is important.

Lest the above matter of skin and interior of malleable be misunderstood, the writer will state that many years ago he made tests on this point by cutting away the portions of special test bars in which the carbon had been reduced by the annealing

action, and obtained the strength of the interior as compared with bars of the same cast not so treated. The results always indicated that in spite of the interior shrinkages the skin has an advantage over the interior of only a few thousand pounds per square inch in strength, and naturally so, as when the carbon was precipitated into the crystalline structure even if it afterwards removed, the spaces must have been left open. The claims made that the interior of a malleable casting is worthless are not justified. Again, malleable castings annealed in fire-clay, or so that no oxidation of carbon from the surface portions was possible, and the change in carbon alone could take place, showed a good high strength almost equal to that of castings annealed in iron oxides. Hence the necessity of taking every precaution possible to get as sound an interior as may be possible under the circumstances, in order to take advantage of the strength of this interior metal.

Still, for one who has made malleable castings in very large quantities, there is a strong temptation to call the interior of a malleable casting worthless, when going over the scrap piles of the dealers in this class of material. There is good malleable and bad malleable.

Referring again to the question of machining malleable castings, it stands to reason that with the carbon partially removed from the skin, there being therefore but little lubrication of the tool, the castings will tear badly, the operation being like tooling off wrought iron or mild steel. Again, with the comparatively low sulphur in the castings, there is considerable difficulty in getting good threads. To have good machining qualities means a composition which makes for poor malleable castings, and vice versa. To machine at all means accentuating the effect of the poorer and unsound portions of the malleable casting as against the stronger and denser ones. A medium course is that now pursued by the malleable founder. That it is not fully satisfactory to either him or the automobile manufacturer may be heard at every plant interested in the matter. What, then, is the proper solution of the difficulty?

The ultimate consumer would probably say: safety first, and ask that the most rigid specifications govern the production of the malleable castings—or any other castings—used on the car he buys. He is unquestionably right, for producing high-grade material, even at a sacrifice of the modern fetish of speed and tonnage, is necessary to secure real efficiency. In the preparation of standard specifications for malleable castings (at the moment being brought up-to-date by the American Society for Testing Materials' committee on malleable castings), one underlying thought has always been that a sharply drawn line should be established between ordinary malleable castings and "specification" work. Whereas all malleable heats should be run as perfectly as the manufacturer knows how, the beginning and end of them are bound to be always somewhat inferior to the middle portions, in which good temperatures for pouring and freedom from undue oxidation rule. The beginning of a heat is apt to be cold, comparatively speaking, and heavy-section castings poured far from the furnace suffer accordingly. At the end of a heat, the temperature of the bath rises so high that with very low silicons there may be an actual bessemerization within the furnace, and so-called "high" iron, or metal full of blow-holes, and indifferent to the annealing process, results. This "high" iron is, however, much to be preferred to "low" iron, which results from annealing material having graphite in its make-up. This class of work is weaker than the poorest gray iron. The malleable founder, unfortunately, always leans toward the "low" or high silicon side of the problem, as he has smaller losses, less attention to pay to the furnace end of the establishment, and fewer kicks from the customers on the surface appearance and machining qualities of his work.

"Specification" Work

In order to differentiate "specification" work from the ordinary, the demands for quality work were made sufficiently strong, but not at all too strong, that the manufacturer of ordinary material use the middle portions of his heats. As, unfortunately, all malleable makers think they produce the best grade of material, chances are taken right along, and all the iron cast goes into specification work. Naturally trouble results, and more attention is given to crawling out of a mess than to making first-rate iron in the first place.

The other underlying thought in preparing specifications was that the maker should be recompensed for his special attention by a better selling price. It is an unutterable nuisance to have specification work side by side with the ordinary run of castings in a malleable foundry, as it is very difficult to get the men to pour at the right portion of the heat, as well as to select the favored parts of the annealing oven. Nevertheless the world moves forward and the wise manufacturer remembers that it is a business axiom to give the customer exactly what he wants, charging him accordingly. If only the malleable producer had the backbone to insist that he be fully paid for the extra care and trouble, all would be well. Instead, however, he takes the chance of slipping by and makes the same price for each class of work, hoping that the extra cost of the specification work will be carried in the general operation.

It seems to the writer, therefore, that the solution lies with the manufacturer of automobiles, through his engineers. Magnificent work is being done along lines of standardization. Why not extend this to the general design of the malleable castings used on cars, to the specifications for manufacture and test, to the subsequent treatment in the automobile shop, etc.? The experience of the American Society for Testing Materials will serve excellently in this respect. The manufacturers were burdened with a multitude of specifications for all sorts of material of construction. They feared the advent of a society to regulate the matter. The result was, however, that hundreds of individual specifications were quickly reduced to a single one, the engineers and manufacturers getting together and settling upon a fair but good line of work. Now mark what followed. The erratic specifications lasted but a few years, for the purchaser found that he was always given what he wanted, but had to pay for it quite heavily. He therefore tried out the standard line of product, and found it served excellently. These standard specifications are constantly revised by those interested on both sides, and have done wonders in promoting the efficiency of our industrial life.

In the malleable field there is nothing required more urgently than specialization in given lines of work. Specification work should either be done in specially selected foundries, or become so general that all foundries must run accordingly. Again, whether in specification work or not, foundries should differentiate their castings into light, medium and heavy, according to the section, and keep furnaces, sprues, mixtures and cleaning facilities in separate departments and even buildings. Or they should specialize solely in given weights of castings, so that the heavy and light-work shops shall become quite distinct. Some of the best known mal-

leable foundries, having wonderful reputations for smoothness of surface and quality of work, would hate to have it generally known that this applies to their light castings only, and that the occasional heavy ones may be found on the scrap heaps of the country—a sorry looking lot.

Since, however, it is quite possible to make light, medium and heavy castings in the same heat, provided the heat be run as if for heavy work only, and this gives the very highest grade of castings for strength and serviceability—other than a fine machining effect—it seems that the real solution, so far as the automobile industry is concerned, lies in the selection of existing plants in central locations for shipping, and the taking over of the complete capacity for automobile specification work only, to the exclusion of everything else. With proper contractural arrangements, and under the control of an inspection system operated by the associated automobile interests, the results would surely be satisfactory. Nor would an injustice be done the other establishments, for they would be free to take the work formerly done by the selected plants in question.

This thought is advanced for consideration, as the result of many years of plant operation, and the production of enormous quantities of malleable castings, most of them good, and some really bad. Every malleable man knows how difficult it is to keep operating up to the top notch when financial considerations compel the running of a furnace when the roof is about ready to cave in, or the rows of annealing ovens have a very non-prohibition aspect. Unless every portion of the equipment is up to the pink of perfection, the best is not possible, although good work can be done. This is stated with the full understanding that it is not good to aim for the maximum of strength possible in making malleable castings, but rather the best bending qualities and resistance to shock.

Discussion By Enrique Touceda

IN PERUSING this paper, it has appeared to the writer that numerous loose and misleading statements have been made, while some that bear on the metallurgy of the process are wholly incorrect in his opinion. As Dr. Moldenke occupies the position of an expert in this industry, what emanates from his pen naturally carries more weight than if similar statements were signed by some one less widely known, and therefore I have thought it both proper and pertinent to contribute the following:

In the first place, it is stated, "It is the purpose of this paper to discuss the qualities of malleable castings of special interest to the manufacturer of automobiles, to describe enough of the process to show how these qualities can best be obtained, and finally to draw whatever conclusion may seem pertinent."

From the foregoing, it is seen that the purpose of the paper is specifically given, but I am forced to state after a very careful analysis, that I cannot see that the author has stuck to his brief, aside from a very indefinite generalization. I cannot find wherein the automobile engineer has been told the details concerning those malleable iron castings of special interest to him, or how the process has been described in a manner that would enable him, or even one very familiar with the manufacturing details of malleable iron production, to gather from the recital how "these qualities" can best be obtained, unless the information is supposed to be covered by the suggestion contained in the lines where the following appears —"With proper contractural arrangements and under the control of an inspection system operated by the associated automobile interests, the results would surely be satisfactory." I cannot see that this suggestion embodies anything in connection with such a description "of the process as to show how these qualities can best be obtained."

In another part of the paper the following appears: "Again as between a silicon content of 0.45 per cent and another heat with this element at 0.75 per cent, the former will give white fracture castings nearly up to ¼-inch thick, whereas the 0.75 per cent metal poured into the same castings will be gray." The foregoing is very misleading, indeed, for while such a case can occur, it very rarely does, but the author has worded it in such a way as to give the impression that this is the rule rather than the exception, though I do not wish to infer that this has been done intentionally. However, at almost the end of the paper, he states: "Since, however, it is quite possible to make light, medium and heavy castings in the same heat provided the heat be run as if for heavy work only, and this gives the very highest grade of castings for strength and serviceability, etc."

Now, practically every manufacturer of malleable iron castings knows this fact, and most of them know considerably more than this, for they are fully aware of the fact that there is no trouble whatever in getting white iron castings with every trace of carbon in the combined state, with a silicon content as high as 1.25 per cent if need be, and with sections over 1½ inches thick. There is no trouble whatever in avoiding what Dr. Moldenke infers in the first sentence quoted must happen, by a simple adjustment of the silicon-carbon ratio. This is very easy and practical to do, while no harm results from the high silicon content, as silicon neither lessens the ductility of the ferrite matrix, nor does it tend to coarsen the grain size.

With reference to the statement in the paper that "The average composition of the white iron as cast, 0.65 per cent silicon, sulphur 0.06 per cent, manganese 0.25 per cent, phosphorus 0.175 per cent, and total carbon (all combined) 3 per cent, etc.", would say that this does not represent the average composition of white air furnace iron, as far as the carbon content is concerned, and this is a very important matter. There are isolated cases where white air furnace iron might run to 3 per cent carbon, but in my opinion this would be a sure indication that the parties making it, unless made by accident, do not understand their business. If 3 per cent carbon is the average content in white iron, then much of it must run over 3 per cent, otherwise 3 per cent would not be the average.

I have picked up haphazard, one of my record books, and have selected therefrom all the white iron samples received from one concern, from Aug. 18 to Dec. 15, a total of 170 samples, and I find that the average carbon content is 2.62 per cent. Out of the 170 samples, I find just one to run as high as 2.90 per cent, the lowest being 2.35 per cent, while the great majority run around 2.55 per cent. As stated, there was no selection about this, and results taken from any of the other companies will show the same fact. In this particular case 2.60 per cent was the carbon desired.

Quoting further, we find "This is

(*Continued on page 246b*)

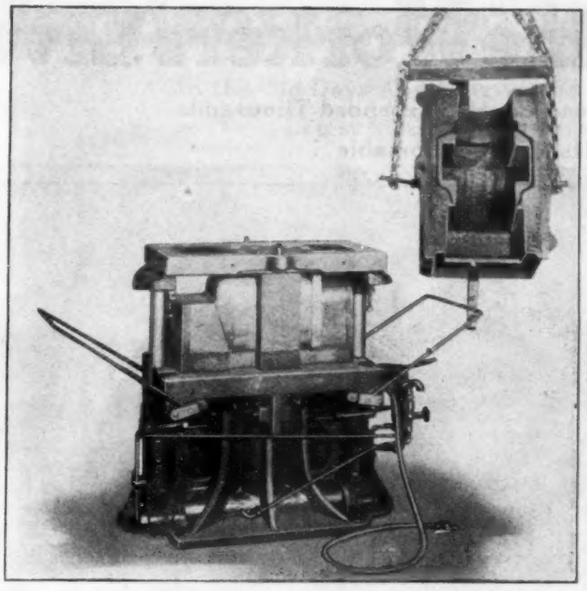


Fig. 1—Osborn Jolt Stripping Plate Machine with Pattern and Mold

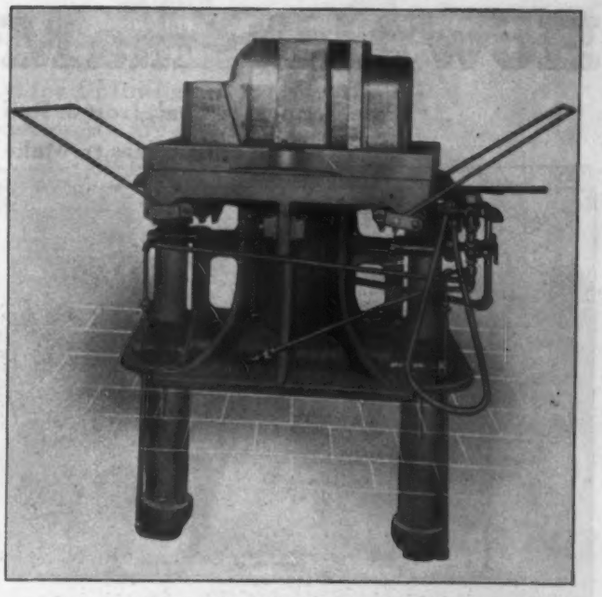


Fig. 2—End View of Machine Showing Cylinders Extending Below Floor Line

Jolt Stripping Plate Machine

Description of New Molding Machine Designed by Osborn Mfg. Co.— Specially Adapted to Heavy Repetition Work

A NEW stripping plate jolt machine designed to perform automatically practically all of the operations necessary for making a mold except shoveling the sand has been perfected recently by the Osborn Mfg. Co., Cleveland. The machine, it is said, is adapted especially for making molds for journal boxes and other comparatively heavy repetition work. It may be used with any of the standard types of stripping plate equipment. The pattern is drawn through the plate by power, and accuracy, therefore, is a feature upon which the builders lay considerable stress. The machine has a rated stripping capacity with 80 pounds air pressure of 800 pounds, a maximum stripping capacity of 1,000 pounds and a maximum jolting capacity of 1,200 pounds. The table is 19⅜ inches wide and 32 inches long. The jolting cylinder is 6 inches in diameter and the draw cylinders are 3½ inches in diameter. The machine is arranged to draw patterns up to 14 inches in depth. The top of the table is 24 inches above the floor line. The size of the table can be varied and where the machine is intended for use with one particular pattern, it is advisable to have it approximately ⅛ inch less than the flask size. In such a case there is no opportunity for sand to accumulate on the table.

The jolting mechanism is of standard Osborn construction. The draw cylinders are cast in one piece and are connected to the base of the machine by large fitted bolts. As shown in the accompanying illustrations, these cylinders extend below the base. They are designed to set inside of 8-inch pipes inserted in the foundation. The piston rod, which also acts as a guide rod, is planed on one side and provided with gear teeth which mesh with pinions cut in a solid shaft extending from one cylinder to the other. The pinion shaft and guide rods are entirely enclosed and self-oiling.

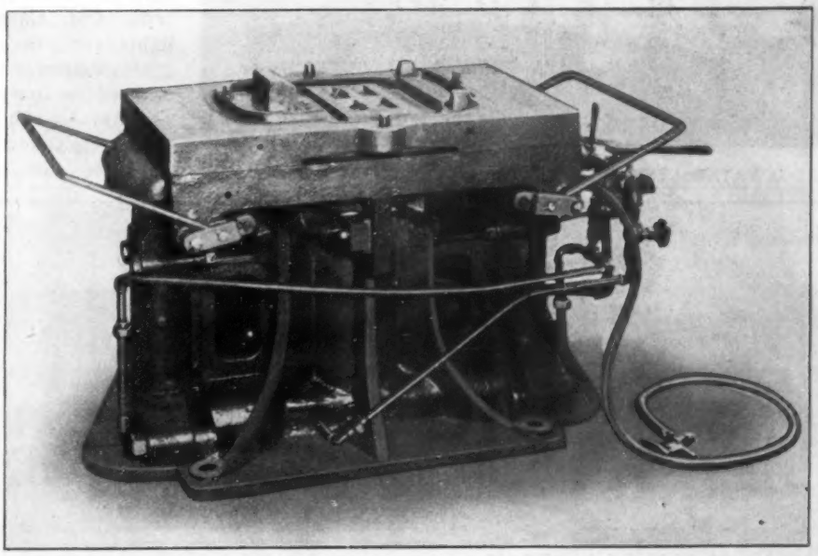


FIG. 3—JOLT STRIPPING PLATE MACHINE READY TO RECEIVE FLASK

The machine is provided with flask clamps operated by air. They are of the bail type, swinging over the end of the flask. The bail is made of spring steel in order to compensate for unevenness in the size of the flask.

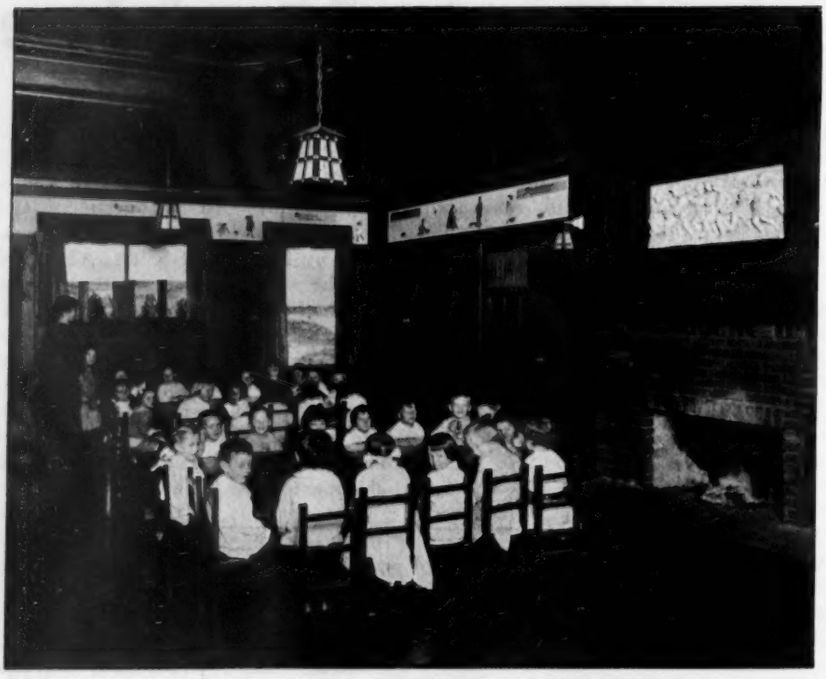
After the flask has been filled and jolted the air is turned into the

(*Continued on page 246c*)

How Alabama Mine Workers Live

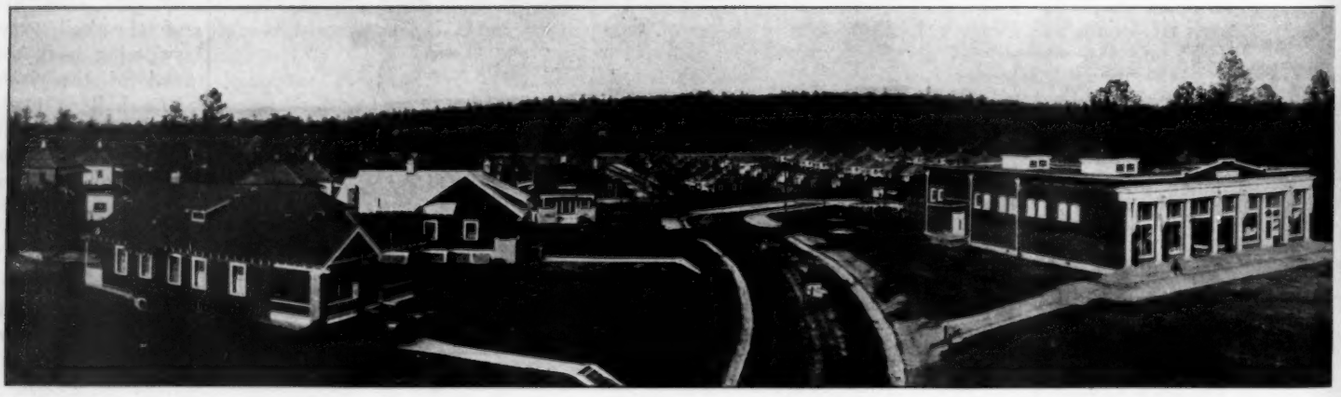
The Tennessee Coal, Iron & Railroad Co. Has Expended Thousands of Dollars to Make Its Men Comfortable

School House, Kindergarten, Church and Residences at



EDGEWATER KINDERGARTEN IN SESSION

HERE is the way the Steel Corporation continues to carry out its policies of making the men on its payrolls good citizens, as well as good workmen. The panoramas show the coal mining camps at Docema and Edgewater, Ala., of the Tennessee Coal, Iron & Railroad Co. In the Steel Corporation's scheme of community development, camps are distinct from towns in that they originally are not expected to become permanent units because they are built in connection with a particular coal or ore deposit which in the course of time may be exhausted. It is apparent, nevertheless, from the views presented that the type of construction followed in these camps is both attractive and substantial. Docema and Edgewater have electric lights, complete water works and fire protection systems, efficient sanitary methods to meet the particular local conditions, schools, churches, hospitals, club houses, etc. The layout of these camps usually consists of



PANORAMA OF VILLAGE AT DOCEMA MINE OF TENNESSEE

Handsome Modern Mine Camps

In the Old Days Anything Would Do for a Mining Camp, Now the Latest Metropolitan Improvements Are in Order

Edgewater Mine of the Tennessee Coal, Iron & Railroad Co.

rectangular blocks grouped around a central plaza. In Docema, the lots are 60 x 120 feet and the streets are 50 feet wide, macadamized and electric lighted. They have gutters and sidewalks with grass areas between. The church, school, etc., are of substantial brick construction. Most of the houses are of the standard four-room double type, clap boarded, with hip roofs and cypress shingles. Edgewater is the most recent camp to be completed but Bayview, Ala., now under construction, will be the last word in camp building. This camp will be the product of the latest and most scientific thought in community planning. A special effort is being made to break up the monotonous effect common in mine towns and no houses similar in type will be built side by side. A model showing the completed camp will be exhibited at the Panama-Pacific exposition. The side engravings show how thoroughly the training of the children of these communities is looked after.

EXTERIOR OF KINDERGARTEN AT EDGEWATER

COAL, IRON & RAILROAD COMPANY IN ALABAMA

The Selling Price of Castings

Record of an Investigation to Determine the Practice of American Foundrymen in Fixing the Selling Price of Their Product

BY A O BACKERT

TO ascertain the methods pursued by foundrymen in estimating the selling price of castings, an investigation was conducted in the course of which 1,000 letters were mailed to all of the members of the American Foundrymen's Association and leading jobbing foundries of the United States. A series of 11 questions was asked and a total of 109 replies was received. It frequently has been stated that the number of foundrymen who make careful estimates on work is not large, yet the bulk of the replies received indicates that an earnest effort is being made to quote intelligently on new work. It cannot be denied that the practice of guessing at the selling price of castings is still too prevalent for comfort and it is hoped that some standard system of estimating will be evolved which can be followed by foundrymen generally. The questions submitted follow:

1.—How do you determine the selling price of your castings?
2.—Do you employ an estimator to compute the selling price?
3.—Do you follow any special rule or formula in preparing an estimate?
4.—What ratio does your overhead expense bear to your labor cost?
5.—What do you include in your overhead expense?
6.—In making an estimate, what allowance do you figure for contingencies such as haulage, special rigging, pattern repairs, rejections, etc.?
7.—What percentage of profit do you estimate on each job?
8.—Does the estimated percentage of profit vary on heavy and light work?
9.—How do you estimate labor cost on a job and what do you include in this estimated cost?
10.—How do you estimate the cost of molten metal in the ladle?
11.—Do you base your estimates on data previously obtained from your cost system?

It was a matter of surprise to note the fact that practically one-half of the foundries employed estimators and operate estimating departments, while a number delegate this work to one of the plant executives. Only one empirical formula was reported for estimating the selling price of new work. Many foundrymen are averse to accepting formulas at their value, believing them to be the obscure symbols of the abstruse sciences. However, in several well-managed shops a similarity of formulas has been found, which would indicate that the adoption of a universal system would not involve many difficulties. This formula used by several foundrymen, follows:

$$W + L + 1\tfrac{1}{2}\ L + C + P = \text{the selling price.}$$

W represents the weight of the casting multiplied by the cost of the metal in the ladle to give the cost of the metal in the casting; L represents all labor, including molding, coremaking, melting, shipping, etc., and 1½ L represents the overhead charges; C represents contingencies and includes casting losses, haulage, special rigging, pattern repairs, etc., and P represents the profit.

The ratio of overhead expenses to direct labor cost was found to vary considerably and as high as 3:1 was reported. Numerous interesting replies also were received in answer to the question regarding percentage of profit estimated and in most cases competition governed this entirely. With few exceptions, all the foundrymen answering the questions submitted reported that they based their estimates on data previously obtained from their cost system. This would indicate that an earnest effort is being made to arrive at accurate costs, but evidently the systems in use are inadequate or they are improperly applied.

In the following an effort has been made to summarize the replies as far as possible, although the wide variance in the nature of the answers made it almost an impossible task to properly classify them:

How do You Estimate the Selling Price of Castings? — The purpose of this inquiry was to ascertain what methods are pursued in fixing the selling price of the foundry product. In a measure, the inquiry was somewhat broad, nevertheless the replies received indicate a wide variance of methods and the need for the establishment of some standard system for making estimates on new work. The following briefly compiles some of the replies:

Nine foundries replied that they made their estimates by the records of the cost of similar work; five determined the selling price by actual cost and add the profit; three estimate the selling price by the cost of molding, iron and overhead, to which the profit is added; one foundry fixes the selling price by estimating the cost of producing on the basis of daily output in pounds per molder; another replied that the price is fixed by the amount of labor expended, materials used, overhead charges, cost of changing flasks and special rigging; one replied "What we can get and by experience"; by figuring each job separately, one reply; three replied "Make close estimate on anticipated cost and add percentage of profit, which varies with the kind of casting;" judgment of estimator and basis of cost records, one; selling price based on American Foundrymen's Association standard cost system, one; by cost and what we can get, four; based on price of pig iron, one; value of molten metal at the spout, plus the direct labor cost and a profit of 8 to 20 per cent, one; estimate molding and core labor, to which is added overhead, cost of molten iron and selling expense, 15; two concens that do repair work for railroad and mills, respectively, replied that the price is governed solely by local competition and that a uniform price for both light and heavy castings for the entire year is made; by estimating cost and percentage of profit, seven; cost of molding, overhead, 5 per cent for loss and defectives, 25 per cent for loss in blowing and 20 per cent net profit, reply from a side-blow converter plant; by taking average cost of several melts, one; total of all materials, labor, overhead and 25 per cent profit, one; direct labor plus melted metal plus indirect cost plus overhead and profit, two; don't estimate if we can avoid it, take a few castings on trial, figure molding cost and make price for long run, one; price based on cost of molding, one; price based on direct labor, one; by actual cost of each pattern, one.

Do You Employ an Estimator to Compute the Selling Price? — Many of the most progressive shops employ special estimators who are trained to fix the selling price of castings from blue prints, patterns, etc. This is a specialty that has developed in recent years and it is unfortunate that estimators are not employed more generally. A total of 43 foundries replied that they employ estimators; 39 are without estimators and a special estimating department; seven delegate this work to the cost department and three to the sales department. In addition, a number of foundries replied that the estimates are made by the superintendent or manager with the co-operation of the foundry and pattern shop foreman.

Do You Follow Any Special Rule or Formula in Preparing an Estimate? —The purpose of this question was to ascertain whether any empirical formula is employed, which in a simple manner and by symbols would contain all of the charges necessary in estimating a selling price. Fifty-five foundries replied

Presented at the Chicago meeting of the American Foundrymen's Association.

that they follow a special rule, but in most instances no formula is employed. Fortythree replied that no special rule or formula is followed. One formula submitted follows:

$$P = \frac{2.14\ M + W\ (F + 1)}{W}$$

P = cost per pound.
M = the molding cost.
F = the cost of melting.
1 = cost of iron including shrinkage and
W = the weight.

The overhead is included in the molding cost charge which is figured at 214 per cent, making the overhead 114 per cent of the labor cost.

What Ratio Does Your Overhead Expense Bear to Your Labor Cost? —Of all of the questions submitted, none is of greater interest to foundrymen and the wide variance in the ratio indicates the source of low quotations on castings and the reason for the large number of failures recorded annually in the foundry industry. While the ratio was asked for, many of the replies were in per cent. It is surprising that this ratio varied from 1/10:1 to 3:1, although one foundry reported a ratio of 6:1, which evidently is an error. With a normal production a ratio of 1.5:1 is generally accepted as a safe margin for overhead to labor cost, although when production decreases overhead automatically increases. This is a feature overlooked by many foundrymen and in place of increasing their overhead per pound of output when production declines, prices usually are reduced and losses necessarily must be incurred.

The following briefly notes the variety of replies received and the differences in this ratio as reported by various foundrymen:

Two hundred per cent on actual wages paid molders; 100 per cent on wages paid coremakers and where special cleaning is required 100 per cent is added to cleaners' time in the cleaning room; differs materially with class of castings made; ratio of overhead to productive labor cost, 300 per cent; 142 per cent of net productive labor in 1913; add 125 per cent to direct labor and 19½ per cent to total cost for selling; normally 150 to 175 per cent according to business conditions and melt; light castings 50 per cent and heavy castings 34 per cent; foundry 65 per cent and office 25 per cent, making a total of 90 per cent; average 1913, 220 per cent; average for five years 114 per cent; molders' overhead 150 per cent, which includes cost of cleaning and coremakers and 100 per cent includes cost of material for cores; about 16 per cent, the salaries of the management being included in the labor cost and the salaries of the officials in overhead; 18 to 30 cents per productive hour; overhead varies on each job; varies on different operations as overhead is divided up and included in the burden for each operation; 100 to 150 per cent on molding labor; foundry overhead 45 per cent and general overhead 45 per cent; depends on what percentage of our capacity we are operating, running 40 per cent capacity the overhead is 50 per cent or more of our total labor cost; ratio of overhead to labor cost was 214 per cent during the last three months and this varies every day throughout the year. In addition to the foregoing numerous replies were received with estimates from 10 to 300 per cent. A number of these follows: 10, 20, 33 1/3, 43, 50, 85, 90, 100, 142, 172.4, 220 and 300 per cent.

What do You Include in Your Overhead Expenses? — The purpose of this question was to ascertain what fixed charges were included in the overhead and with few exceptions, most of the foundrymen endeavor to include all charges that cannot be classed as labor material, etc. One foundry replied that all factory expenses, including depreciation and factory supervision other than productive labor and material, were classed as overhead expenses, but minor materials such as core sand, etc., are not passed through the stores, but are charged as an expense and are included in the overhead. A few of the replies received follow:

Melting fuel, supplies, repairs to equipment, cupola labor, salaries, errors, laboratory expense, but this does not include the interest, depreciation and general superintendence of the plant; executives' salaries, clerk hire, insurance, rent and taxes, traveling expenses, teaming, etc.; interest, depreciation, advertising, rent and repairs to equipment; all expenses except wages of molders and coremakers; all supplies, maintenance expenses, etc., and all labor except direct productive labor, but general office expense, including salaries, insurance, taxes, selling expenses, etc., are figured as a percentage of direct labor cost and are added to this item; insurance, taxes, interest, legal expense, salaries, office expense, general expense, repairs, defective loss, shipping, yard force, superintendent and clerical help, accidents, laboratory, advertising, commission and traveling; everything except raw material and direct labor is charged in the overhead; salaries, expense of building, freight and teaming; office expense, insurance, interest, general expense, expenses of small tools, stable, machinery and fixtures, traveling, advertising, supplies, lighting, royalties, power, taxes, legal expense and 5 per cent depreciation on machinery and fixtures, real estate and stable inventory; all charges that cannot be applied to any specific order; helpers, blower expense, machinery depreciation, insurance, taxes, heat, light, power, small tools and supplies, proportion of pattern costs, casting cleaning and proportion of office expense; miscellaneous labor, miscellaneous supplies, expense on rejected castings, heat, light, power, insurance, depreciation on plant and equipment and superintendence; depreciation on everything entering into cost of manufacture except direct labor, indirect labor, materials directly entering into product and incidentals which are dircetly connected with any manufacturing operation; all expenses of every kind except productive labor; fuel, fire brick, clay, sand, repairing tools and machinery, general repairs, general expense, teaming, oils, electric light, taxes, power, miscellaneous supplies, all foundry labor except molding and coremaking, general office expenses and accident liability.

The foregoing indicate that an earnest effort is being made by foundrymen generally to arrive at their overhead expenses, although it is evident that various methods are pursued and undoubtedly cost experts could point out many errors in the apportionment of the overhead expenses.

In Making an Estimate What Allowance do You Figure for Contingencies, Such as Haulage, Special Rigging, Pattern Repairs, Rejections, Etc.? — Only too frequently many of these items are overlooked in estimating the price of selling castings and unforeseen contingencies frequently arising which result in losses being incurred. One foundryman states that his product covers a range of material from castings weighing three tons each to rough, light hardware, so that allowances for contingencies, etc., must be based on practical experience and are different in every case. He added that on the accurate gaging of these expenses the success of most foundrymen depends and he considers this one of the most important items in estimating the selling price. Another foundryman replied that these items enter directly into manufacturing expense or overhead, with the exception of rejections. As he is engaged in the automobile cylinder castings business, the rejections are higher than normal, which are included in the defective castings record and are charged after the overhead is computed. In another instance no allowance is made for any of these items unless new patterns or special rigging is required, in which case the actual cost is borne by the customer if a small order, and is absorbed either wholly or in part by the foundry in the case of a large order. Other replies briefly are as follows:

Make no allowance but make the price high enough to include any special hauling required; in making an estimate we approximate as closely as possible the actual cost to us of haulage, special rigging, etc.; no special rule, when competition is keen, the margin is close; items included in overhead generally, but we take into account the cost of special rigging and in the case of especially difficult and intricate work we make additions to cover the extra cost and liability of rejection; it differs on each job according to the class of work; covered in overhead expenses; 10 to 20 per cent; included in the overhead; 2 to 12 per cent; 7 per cent on hand molding and 15 per cent on machine molding; all included in overhead except rejections, which are figured by percentage according to the individual job; no contingencies are figured for hauling, special rigging and pattern repairs and if such are needed, the costs are figured in the estimate; the amount allowed for rejections depends entirely on the class of castings and is usually estimated by the superintendent; make special allowance

for each item; pattern repairs are charged to customers and a certain percentage is added to every estimate for rejections, the amount depending on the class of work; where special rigging is necessary, the actual cost of labor and material is charged to the job, while haulage and other contingencies are included in our overhead; special rigging, haulage and pattern repairs are included in foundry overhead expenses; 40 per cent; 5 per cent; 25 per cent is added to cost of labor and materials; about 3 per cent of direct labor for special rigging and pattern repairs and an average of 18 per cent for rejections; carried in allowance for profit; estimate contingencies as closely as possible, based largely on previous experience; special rigging is added to the estimate, but other contingencies are taken care of by the burden; inward cartage is charged to the cost of materials, outward cartage is a sales expense and is charged to the same and we accept only long runs of work, rejecting all short runs requiring special rigging.

Pattern repairs other than sandpapering or shellacing are charged to the customer, while rejections vary, but should not exceed 2 per cent after the goods have left our hands; freight and pattern repairs generally are charged direct to the customer at cost; we add $1 per ton for hauling and usually 2½ per cent for special rigging; haulage is charged direct to material which shows up in the pound price of material; shipping is charged direct into a separate sub-division showing up in the pound price; special rigging is charged in a sub-division to the job order on which it is used; pattern repairs are charged into repairs pattern sub-division; rejections from the foundry are covered by a foundry scrap percentage and from customers into a reserve account known as "customers scrap."

What Percentage of Profit do You Estimate on Each Job? — This proved to be an exceedingly difficult question for most foundrymen to answer, owing to the fact that competition to a large extent governs the amount of profit that can be obtained. One foundryman stated that he endeavors to obtain 20 per cent, but frequently he found competitive conditions such that a larger profit could be obtained on some jobs while on others the profit had to be greatly reduced. Based on figures of his annual business, he found that the profits varied from nothing at all, or even a pretty stiff loss to 25 per cent during an exceptionally good year. Another foundryman stated that he does not estimate any particular percentage of profit on each job since the overhead figures are on the safe side to the extent of from 3 to 5 per cent, and then is estimated a profit varying from 5 to 15 per cent, depending upon what the job is supposed to carry. One foundryman operating a large plant in the west replied that he has what is known as a critical output below which he cannot cover overhead expenses and up to this critical output business will be taken at cost rather than turn it down. Above this critical output from 10 to 30 per cent profit is figured, according to the size of the job and the state of the market. Another foundry engaged principally in the production of heavy work figures a fixed amount of profit for each molder's daily output, regardless of what it is. The majority of the replies indicate that the foundrymen endeavor to obtain a profit varying from 5 to 50 per cent and a fair average would be 20 per cent. Also the practice varies in figuring the profit for light and heavy work. However, many of the replies point out that while profits are figured, nevertheless in the stress of competition they frequently are entirely overlooked.

Does the Estimated Percentage of Profit Vary on Heavy and Light Work? —Opinions differ widely on the percentage of profit that should be figured for light and heavy work. One foundryman states that it should vary and points out that most foundrymen consider heavy work the most profitable. This he claims is a fallacy as there is no reason why light work with modern methods should not be just as profitable as heavy. However, another foundryman states that one general percentage of profit should be figured regardless of whether the work is heavy or light.

While there is no uniformity in the practice of estimating the percentage of profit on heavy and light work, the majority of replies point out that the profit varies, the larger profit being figured for heavy work and a smaller profit on light work. On the other hand, several foundrymen insist that the same percentage of profit should apply on both light and heavy work. While some foundrymen estimate a larger profit on heavy work, others demand an increased profit for light work and the replies indicate no uniform practice among foundrymen in estimating the profit on castings of varying weights. This is a feature of selling price estimating that should receive the careful attention of the cost committee of this association.

How do You Estimate the Labor Cost on a Job and What do You Include in This Estimated Cost? — One of the unknown quantities in estimating the price for new work is labor cost and the replies indicate that this cost is estimated largely by experience and past performances on similar work. The majority of the replies pointed out the method of estimating the labor cost after the job has gone through the foundry, but this information was not sought. One foundryman stated that his estimate of labor cost on a job is obtained from the foreman and superintendent, who figure on the number of hours it will take to do the work and an effort is made to be on the safe side. In this estimate are included the cost of coremaking, helping and molding and this generally is figured in cents per pound and is added to the other charges. After the job is completed a rough estimate is made to see how closely he approximated the original figures and in time this will give a fairly accurate idea of how close these figures are being made. Another foundry replied that the labor cost is estimated by comparing the job with similar jobs previously turned out. In one shop the labor cost is estimated by the foreman after consultation with his assistants and includes the actual labor of molders' and helpers' time only, being figured at a rate which includes the time spent in pouring. For example, a man to whom $3 per day is paid would be figured at the rate of 40 cents per hour for actual molding time. In another shop the labor costs on all jobs are estimated from piecework rates furnished by the superintendent of the foundry made up by him covering the jobs. The molding, cleaning and machining, core and annealing costs are included in these labor figures. The interesting practice in one shop is to determine the amount of time required and to double it to cover overhead expenses.

How do You Estimate the Cost of Molten Metal in the Ladle? — Estimating the cost of the molten metal individually is a practice not pursued by many foundrymen, although one explained his method in great detail as follows: "We go on the assumption that the molten metal is delivered into the ladle as though it came from some outside shop. This cost includes the cost of the metal in the yard on the basis of the particular charge being used at that time and to this is added a general average coke charge based on the yearly purchase of coke on the basis of the coke ratio, and to be on the safe side, we figure about 5:1, although our cupola practice is better than this. We figure lining on the basis of the material required during the year for this work and then figure the power required to operate the cupola, adding floor, elevator and all labor in connection with handling iron and attendance during melting. We figure a depreciation charge and repairs actually based on the value of the apparatus for doing the melting, which is aside from the general depreciation in the rest of the shop. The loss is figured on the results of many experiments and includes loss of metal through slagging, spills, etc. Another loss is added to cover the difference in the value of the metal going into the cupola and the scrap made in the shop and this is charged against the cost of melting. All of these items are added and divided

(*Continued on page 246b*)

Large Floor Plate

Electrical engineers have given much study to their machine shop problems. The Crocker-Wheeler Co., Ampere, N. J., has given this matter special attention. The company now has one of the largest and most completely equipped floor plate shops in the world. It was designed and built by the engineers of the company and is equipped with a sectional cast iron floor 65 feet long and 47 feet wide. The sections are embedded in concrete which keeps them level. In the center of the shop is a boring table 18 feet 10 inches in diameter which is level with the floor, making it possible to turn work of considerably larger diameter than table. The table has a central boring bar and an Espen-Lucas boring stand. There is also in this mill a Newton slotter with a stroke of 82 inches, an Espen-Lucas horizontal drill and a 6-foot radial drill press. A 30-ton Niles electric crane runs on overhead tracks; it has a span of 60 feet, which makes the work of moving the portable machinery and mill work comparatively easy.

Scrap Dealers

Perfect National Organization—Rolling Mill Company Admitted

Organization of the National Scrap Iron and Steel Association was effected at a gathering of nearly 100 scrap dealers Jan. 19 at the Hotel La Salle, Chicago. Representatives were present from the central division, which includes Pittsburgh, Youngstown, Cleveland, Detroit and other cities in that vicinity, as well as from the western division, which centers at Chicago and includes St. Louis, Kansas City, Minneapolis, St. Paul and other western points. The following officers were elected for the national association:

President, W. K. Kenly, Chicago; vice president, D. R. Cohen, Chicago; treasurer, J. R. Lieberman, Chicago; secretary, Fred Mayer, Chicago; associate secretary, C. H. Lipshitz.

For the central division the following were chosen: Chairman, E. A. Schwarzenberg, Cleveland; secretary, A. Bialoski, Cleveland; first vice president, Wm. Wilkoff, Youngstown; second vice president, Harry S. Grant, Detroit; directors, B. Ginsburg, Detroit; Myron A. Cohen, Cleveland.

For the western division the new officers are as follows: first vice president, M. M. Lieberman, Chicago; second vice president, James S. Miller, Chicago; directors, Herman Sonken, Kansas City, Kan.; Louis L. Bornstein, Indianapolis.

The constitution provides that the president and the secretary of the national association shall act as president and secretary of their local division, which accounts for the fact that no president and secretary was elected this time for the western division. Mr. Kenly and Mr. Mayer serve ex-officio in these positions.

The constitution and by-laws were adopted practically as presented, efforts to change the name to the United States Scrap Iron Association and to change the annual dues from $25 to $50 being defeated. A change was made, however, in the constitution as reported in order to allow producers as well as dealers to become members. As a result of this, the American Rolling Mill Co., Middletown, O., became a member, the first producer to align itself with the scrap dealers.

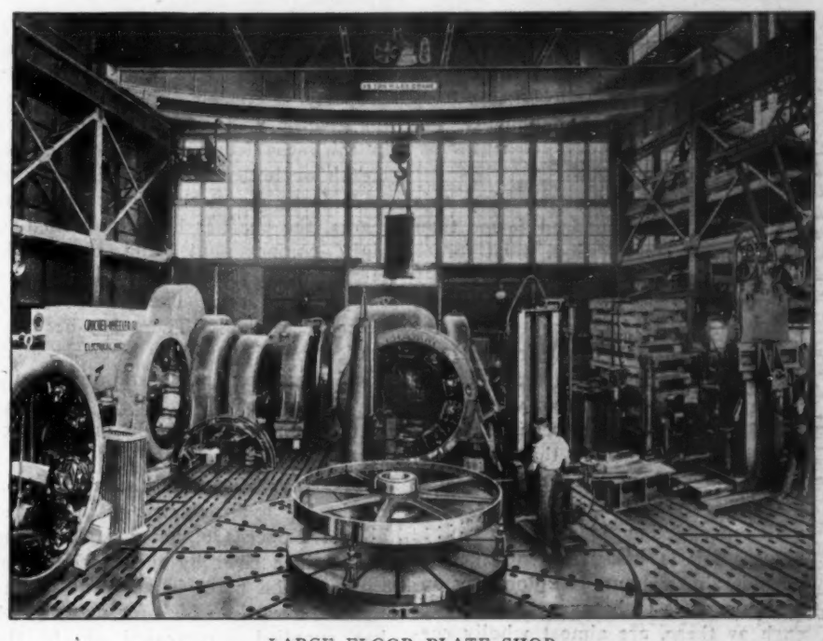
Immediately following the business session a banquet was served at which M. M. Lieberman, first vice president of the western division, presided as toast master and addresses were made by Judge Marcus A. Kavanagh of the superior court, L. J. Birkenstein, president of the National Association of Waste Material Dealers, and L. Zellanger, assistant corporation counsel for the city of Chicago, representing Mayor Harrison.

A pleasant detail of the evening was the presentation to the retiring secretary, Burton L. Verner, of a Masonic ring studded with diamonds, in appreciation of his efforts during the first year of the organization.

Wage Cuts

Made by Operators of Steel Plants and Coke Works

Wage reductions have been made the last week or 10 days by some of the more prominent steel mill and coke plant owners. The Youngstown Sheet & Tube Co., Youngstown, readjusted scales affecting the wire department, Jan. 16, making cuts ranging from about 10 to 15 per cent. Wire drawers went on a strike shortly after the revised scale was announced, but the majority of the men returned to work before Jan. 25. Other departments probably will be affected by similar cuts in the near future. Owners of the plant hope to return to previously prevailing scales as soon as business conditions warrant.



LARGE FLOOR PLATE SHOP

The W. J. Rainey Coke Co., on Jan. 21, announced that it had been forced to reduce wages about 10 per cent because of the depression in business. The company is now operating under the 1910 scale, but hopes to return to the 1912 scale as soon as conditions become more normal. The Rainey scale probably will be adopted by independent coke companies in the Connellsville regions that had not previously readjusted wages. Many coke operators have made cuts the last 18 months.

The Reading Iron Co., Reading, Pa., will readjust wages Feb. 8, it is understood. Puddlers will be reduced from $5 to $4.50 a ton for boiling, and other employes will be affected in proportion. Amalgamated Association puddlers are receiving $5.50 a ton.

Little Activity on Old Ranges

New Year Opens With Many Mines Idle and Working Forces at Others Greatly Reduced—General Expectation of Improvement

Due to causes which are well known and which date back several months prior to the outbreak of the European war, the advent of which dissipated the last lingering hope of a trade revival in 1914, the year just ended closed with mining operations on the old ranges of the Lake Superior iron region far below normal and at the lowest ebb in many years. A large number of mines are idle. Nevertheless, while there is a lack of definite data on which to base optimistic views, it is the general belief of mining men that the outlook is not without its promise. There is, somehow, a universal feeling that a notable improvement in the iron industry will be experienced the next few months and ore shipments the coming season will get back practically to the 1913 basis.

The men employed at the mines this winter are many hundred fewer than a year ago. In addition, most forces are working only part of the time—in some instances averaging 12 days a month. With few exceptions, a reduced wage scale is in effect. However, the fact that comparatively little ore will be mined this winter will not find the mines unprepared to respond to the demands that might be made upon them. There are large stockpiles on all three ranges, and, while production is small, development work is being accomplished in considerable volume. Exploratory operations, as is to be expected in times such as these, are almost wholly suspended. Iron manufacture within and adjacent to the mining region is much less than normal. The furnaces at Marquette, Manistique, Ashland and Wells are out of blast. Only the Pioneer Iron Co.'s stack at Gladstone and the Lake Superior Iron & Chemical Co.'s plant at Newberry are in commission.

Among the more important work of improvement undertaken in 1914, an operation in progress at Ferdinand Schlesinger's Newport mine at Ironwood—the giant of the Gogebic range—stands out prominently. This is the reconstruction of "D" shaft, the main outlet of the big property. A heavy wall of steel and concrete is being put in from top to bottom, a distance of 2,600 feet. The work has been in progress for several months and will not be completed much before the opening of the shipping season. A somewhat similar improvement has accomplished at M. A. Hanna & Co.'s American mine at Diorite, Marquette range. Excepting only the Steel Corporation's Champion, idle for several years, the American is the deepest mine in the Marquette district. It will, it is expected, be operated briskly in 1915, giving employment to 300 or 400 men.

For more than a year and a half, there has been under way at the Hamilton shaft of the Steel Corporation's Chapin mine at Iron Mountain, Menominee range, a work which will put an end to the annoyance caused by the large water flows common to the limestone formation in which the property is opened. The shaft is being given a wall of concrete six inches in thickness from surface to the sixteenth or bottom level, a distance of 1,425 feet. Formerly of six compartments, the shaft is being increased to eight compartments and the inside measurement from 7 by 21 1/3 feet to 9 by 21 1/3 feet. The partitions are of concrete slabs. There has been installed on the twelfth level an electrical pumping plant of a capacity of 3,000 gallons a minute. A similar installation will be made on the sixteenth level.

The year 1914 saw the completion of the big hydro-electric plant erected at the Upper Quinnesec falls of the Menominee river by the Steel Corporation. The plant is adjacent to the hydraulic works which for many years has supplied compressed air to the Chapin mine, and it was constructed also to serve that property. On the Marquette range, the Cleveland Cliffs Iron Co. is giving the hydro-electric plant at the Republic mine a general overhaul, as a result of which will be a material increase of efficiency. A transaction of importance during the year was the transfer of the Republic property from the Cambria Steel Co. to the Cleveland Cliffs interests. For several months there was conducted at the old Kloman mine at Republic by George S. Finney experiments in concentrating low grade ore, Mr. Finney representing Chicago furnacemen. The tests were successful, it is understood, the quality of the mineral treated being brought up to 65 per cent. The experiments will be resumed in the spring. At Marquette, the New Process Metals Co. completed during the fall the erection of the Ardis furnace, the invention of John T. Jones, and has since been engaged in making test runs and various minor changes in equipment. The metallization of the ore has been accomplished successfully. The important point to be determined is the economy of the process, the plant being designed to treat low-grade material of little or no present value.

Gogebic Range

On the Gogebic range, the Steel Corporation is employing 1,500 men in its Michigan mines, whereas the normal force is 2,500. Only at the Tilden mine at Bessemer, where 275 men are at work, and at the New Davis and Geneva explorations, where shaft-sinking is in progress, are the crews on full time. The company's mines at Ironwood—the three Norries and the Pabst, Aurora and Puritan—are being wrought on half time and with less than 1,200 men. Corrigan, McKinney & Co.'s three mines at Bessemer—the Colby, Ironton and Winona, employing normally 900 men—are closed, as is the Lake Superior Iron & Chemical Co.'s Yale property in the same field. The Ashland mine at Ironwood, operated by Congressman E. A. Hayes and brother, of California, had been wrought practically on a normal basis, until recently, when shaft repairs were started. Its crew of 265 men are at present on half time. All ore in stock was shipped the past season. M. A. Hanna & Co.'s Wakefield mine is a scene of activity. While Butler Bros. are continuing their stripping operations, at last advices utilizing three steam shovels, the mining company is engaged in developing that part of the deposit to be wrought by underground methods. Upwards of 300 men are at work in all, and at full time. The Wakefield shipped more than 300,000 tons the past season—its initial season—and could easily have sent out half a million tons had the ore been needed. It is the largest pit mine in Michigan. The Schlesinger interests are employing 900 men on the Gogebic. Of these, 850 are at the Newport-Bonnie, at Ironwood, and the remainder at the Anvil-Palms, at Bessemer. Normally, a combined force of nearly 2,000 men is employed. Shaft-sinking is in progress at the Anvil-Palms. The big Newport shaft is undergoing repairs, a work that will not be finished until

spring, and in the meantime all hoisting is being done through the Bonnie. Excepting the Steel Corporation, Newport company and Hayes Bros., which are maintaining the old scale, all mining concerns operating on the Gogebic have cut wages 10 per cent. During the year, seven-ton skips, the largest on the range, were installed at the Pabst mine. No. 10 shaft of the Tilden was provided with a fine boiler house of steel and concrete construction. A notable record was made at the Newport mine when during the month of March 80,000 tons of ore were hoisted from the main shaft, the best performance for a single shift of eight hours being 4,065 tons.

Menominee Range

Mining operations on the Menominee range are at particularly low ebb. In the Dickinson county (Mich.) fields, only 2,200 men are at work, many of these on part time, the forces of the Steel Corporation at the Chapin and Aragon mines averaging but 12 full days a month. The properties out of commission include the Millie, controlled by the Clergue interests of Montreal; the Traders, an open-pit of the Republic Iron & Steel Co. and Oglebay, Norton & Co., wrought only during the summer; the Walpole, of the Pewabic Co., of Milwaukee; the Calumet, Vivian and Verona, of Pickands, Mather & Co.; the Cundy, of the Steel Corporation; the Munro, a summer proposition, of Rogers Brown & Co.; the Norway, of the Cambria Steel Co.; the Breen of the Mineral Mining Co.; the Quinnesec, of Corrigan, McKinney & Co., and the Groveland, controlled by Ohio furnace interests and closed early in 1914 on account of litigation. At its Chapin mine, including the Hamilton and Ludington, the Steel Corporation is employing 610 men, and at its Aragon property 300 men. The Cambria Steel Co. has approximately 700 men on its payroll, the most of these at the Curry, Brier Hill and West Vulcan and practically all of the remainder at the East Vulcan and East Central Vulcan. Wages were reduced 10 per cent on Nov. 1, last. A force of 40 men is at work at the Indiana property at Iron Mountain, where the Thomas Furnace Co., of Milwaukee, recently instituted development. In the Iron county (Mich.) fields, the list of inactive mines is lengthy.

Only at the Caspian, Riverton and Zimmerman are operations on a normal basis, and at each one considerable development work is in progress. Most of the companies in the district have reduced wages 10 per cent. A large amount of ore is in stock. The majority of the mines in the Crystal Falls region of Iron county are inactive. While in normal times, upwards of 2,000 men are employed, only about 550 are on the payroll at present, and few of these are working six days a week.

Marquette Range

While operations were not at the maximum, close to 6,000 men were employed at the mines of the Marquette range a year ago. Full time prevailed. Approximately 4,200 men are on the payrolls now. Only part of the forces are working six days a week. The Steel Corporation has been producing little ore on the range for the last eight or ten years, principally for the reason that it owns some of its properties in fee and may hold them in reserve without paying royalties. Prior to the company's great expansion on the Mesabi range —the absorption of the Hill and other properties—close to 2,000 men were employed at the Steel Corporation's Ishpeming mines alone. At present the company's entire force on the Marquette range approximates 600. It has been many years since the Cleveland Cliffs Iron Co., the largest operator on the Marquette range, has produced on the curtailed basis in effect the present winter. In addition to closing several properties and reducing the crews and the hours of labor at others, the company was forced to cut wages 10 per cent, the order applying to every person on the payrolls, from the president down.

The Cleveland Cliffs company has some large stockpiles on the range, particularly at the Maas, Stephenson and Salisbury, the stocks at these three properties aggregating a million tons. Exploration is in progress at the old Dexter mine, recently unwatered, and at three or four tracts west of Ishpeming, where diamond drills are employed. Of the properties of the Breitung company, the Marie Charlotte No. 1 and No. 2 and the Breitung Hematite at Negaunee are employing small crews on development work solely, the Breitung Hematite No. 1 is in full commission and the Lucky Star, where only shaft-sinking has been under way, is idle, as is the Baron property at Humboldt.

The county board of viewers of Allegheny county, Pa., has filed its award of damages in the case of the condemnation by the Pennsylvania Railroad Co. of the Moorhead mill property in Sharpsburg. The viewers have allowed Moorhead Bros. & Co. $217,767.

Obituaries

Samuel D. Kinney, superintendent of the Baldwin Locomotive Works, at Eddystone, Pa., died at his home in Philadelphia, Jan. 22, from heart disease, aged 51 years.

Lyman T. Eddy, who had been associated with the McCoy-Linn Iron Co., Milesburg, Pa., for 42 years, died Jan. 16. Mr. Eddy was born in Milesburg Jan. 30, 1841, and was prominently associated with the business, religious and political interests of the community. He filled various offices with credit.

A. O. Slentz, vice president and general manager of the Canton Foundry & Machine Co., Canton, O., died recently from an attack of heart failure. Mr. Slentz, who was 69 years old, had been employed by the company for more than 14 years in developing its line of machine tool specialties and sheet metal machinery.

Henry G. Morris, an inventor of various mechanical appliances and sometimes referred to as the inventor of the automobile, died at his home in Philadelphia, Jan. 19, from a complication of ailments, aged 75 years. Beginning in his early youth, he devoted his life to devising machinery of various kinds. In association with P. G. Salom in the late 80's, he perfected a self-propelling vehicle and in 1895 a gold medal was awarded them in a motorcycle test in Chicago. This, it has been said, marked one of the beginnings of the automobile. The Franklin Institute of Philadelphia bestowed the John Scott legacy medal on Mr. Morris for this invention. Mr. Morris was a native of Philadelphia and was educated at Haverford college. Upon graduation, he engaged in the manufacturing business and later formed the firm of Morris, Tasker & Co., early manufacturers of wrought iron pipe and boiler flues. Later, he became sole owner of the Southwark Foundry and was recognized as one of Philadelphia's leading industrial figures. He became a director of the Pennsylvania Steel Co. in 1870 and assisted in bringing about the early development of bessemer steel-making at Steelton. Mr. Morris was a member and past vice president of the American Society of Mechanical Engineers. He was a past president of the Engineers' Club of Philadelphia, of the American Institute of Mining Engineers, of the American Society of Civil Engineers and of the Franklin Institute.

Four Stacks Added.—The Carnegie Steel Co. now is operating 26 of its 59 blast furnaces, having blown in one Duquesne and one New Castle stack the last few days.

Problems of Capital and Labor

Henry Ford Explains the Operation of His Profit Sharing Plan to the Federal Commission on Industrial Relations

Profit-sharing with employes under the widely-heralded plan adopted more than a year ago by the Ford Motor Co., Detroit, has proved a complete success in practice, according to Henry Ford, president of the company, who last week recorded with the Federal Commission on Industrial Relations at New York City, a formal statement of the results accomplished. Mr. Ford's statement was made up of answers to a set of written questions which previously had been submitted to him by the commission. He said the company has eight members, is capitalized at $2,000,000 and that last year it did a gross business of between $80,000,000 and $90,000,000 with profits of about $25,000,000.

The statement in part, follows:

Every man working for the Ford Motor Co. is first entitled to his just wages as such, depending upon efficiency and responsibility, which wages are about 15 per cent above the usual market wage for the service in question, and then every one who is eligible is entitled to a certain profit. The minimum daily income under the plan, wages plus profit, is $5. The hourly profit-sharing rate (added to wages) is based on the wage rate, and so arranged or graduated as to give those receiving the lowest hourly rate the largest proportion of profits. For example, a man receiving 34 cents per hour has a profit rate of 28½ cents per hour in addition and a total daily income of $5, whereas men receiving 54 cents per hour wages have a profit-sharing rate of 21 cents per hour, with a total daily income of $6. The working day is eight hours instead of nine as before; the week 48 hours.

Wages and profits are paid every two weeks in currency.

Qualifications of Participants

Those qualified for participation in profits are of three classes:

(1.) Married men living with and taking good care of their families.

(2.) Single men over 22 years of age who are of proved thrifty habits.

(3.) Young men under 22 years of age, and women the sole support of some next of kin.

The person must be in the employment of the company six months before he can participate in profits, which rule serves to deter men from leaving other steady jobs.

A record of facts is made in the case of each individual, and every employe qualifying under the above, able to use the money constructively, for the good of self, dependents, and the community in general, is awarded a share according to schedule.

Wages are paid according to skill, and skill subdivided into degrees of skill. The company has but eight rates of pay operative in the shop or on its hourly wage pay-roll. A separate rate of wage applies to each skill rating. An employe may know the reward of his increased efficiency and development and of all the possibilities and probabilities for advancement with the company at the times of entering its employ.

The company maintains a corps of 40 men, good judges of human nature, who explain opportunity, teach American ways and customs, English language, duties of citizenship, who counsel and help the unsophisticated employes to obtain and maintain comfortable, congenial and sanitary living conditions and who also exercise the necessary vigilance to prevent, as far as possible, human frailty from falling into habits or practices detrimental to substantial progress in life. The whole effort of this corps is to point men to life and make them discontented with a mere living.

Purpose of the Plan

You ask our purpose in establishing this plan. Our first purpose was substantial justice to our co-workers, without whom we could have accomplished nothing. We had had great success, and in fact we desired no greater success from a mere financial point of view. For a long period we had been contemplating some plan, but every one suggested seemed fraught with objections. We finally decided to go forward with this one and feel our way along to a position of substantial justice. We do not regard it as in any sense a gift or charity, but only due reward for service.

Prior to the inauguration of the Ford Motor Co.'s profit-sharing plan the company was entirely satisfied with the individual and collective output and efficiency of its men. There was no thought of betterment in this direction, no measure of economic benefit made in anticipation, no desire for publicity or other gain to the company incorporated into the plan or considered with reference to it.

The object was simply to better the financial and moral status of the men.

No man is influenced to change his mode of living, his habits or character in order to qualify under the profit-sharing plan if he does not willingly so elect.

Whereas at start 60 per cent of the men were receiving a share of the profits, six months later 75 per cent of the men were enrolled as participants, and at the end of the first year 87½ per cent of the entire force were participating, representing practically all of the men past 22 years of age with very few exceptions.

The increased efficiency of the men under the plan has been from 15 to 20 per cent with reference to work produced, which is further emphasized when you consider that the improvement was made in an eight-hour day versus the comparison in a nine-hour day.

Daily absentees from work have decreased from a total equivalent to 10 per cent of the working force under old conditions to three-tenths of 1 per cent.

Effect on Employment

The number of men leaving the employ of the company since the profit-sharing plan started, in comparison with the year previous is shown below:

	March, 1913	March, 1914
Discharged	1,276	166
Quitting	870	115
Five day men	5,156	166

Five-day men are the "floaters," so-called, who leave without explanation or notice.

Fear and worry in the struggle for livelihood to properly provide for home and dependents with the dread of what might happen of the job is lost have practically been eliminated.

No man is discharged from the service of the company until he has been proven utterly unfit from every standpoint. If he fails to make good in one department, the foreman of that department sends him to the clearing house, and he is given repeated trials, if necessary, until he makes good, or it is proven that he does not want to succeed. A recent ruling of the company requires the approval of one of four men before the man can be finally dismissed. Of the four, two are, respectively, the president and the vice president of the company.

Bank accounts show an increase during the first six months of 130 per cent. Life insurance carried, 86 per cent. Value of homes owned outright, 87 per cent. Value of lots owned outright, 86 per cent. This remarkable showing refers only to such employes as are on the profit-sharing basis.

Careful medical survey reveals a substantial improvement in physical attributes.

Upwards of 200 men have been influenced and helped to obtain citizenship in the United States.

A carefully prepared map of the city shows that 8,000 families have changed their place of residence since the plan was started, and a study of the districts into which they have moved, and from which they came shows that the migration has been from poor and squalid to healthy, sanitary quarters, with environment conducive to health, happiness and comfort.

Fewer in Police Court

Results on character and steadiness of men may perhaps be best measured and more thoroughly understood by agencies outside the company.

Police justices say whereas Ford employes, recognized by their badges, were almost daily seen in the prisoner's dock, up to a year ago, since January, 1914, they have been noticeably absent and are rarely among the unfortunates brought to justice.

A large proportion of our employes

Problems of Capital and Labor

How Men Are Made Better and Their Efficiency Increased—Could Take All Prisoners From Sing Sing and Reform Them

were foreign born, many of them recent arrivals and not used to American habits and surroundings. Very few, if any, resented our guiding them into better conditions, into habits of thrift, saving, sobriety and improved moral and social conditions. No coercion is laid upon any employe, but if he is not living a sober life, or is neglecting his duties as a father or husband, and he persists in such course, he can not be an associate in our business.

No man can bring up a family and hope to own a home on the ordinary rates of wages.

I do not think any man can do good work mentally and physically for more than eight hours per day.

Conditions, Not Theories

Theoretically, some persons may argue that we have no right to inquire how a man lives at home, so long as he does his work at the factory, but we are talking of conditions, not of theories. Our experience leads us to conclude, beyond doubt, that the interest taken in employes as to their individual welfare is most desirable from every standpoint, not only that of the employe and his family, but of the business itself.

The ever-increasing interest developed in our plan by other employers of labor and the individual expressions of the men themselves, which we have taken great pains to learn from disinterested sources, further prove the correctness of our views.

Any manufacturing institution that is successfully making a single product, should increase the business and its plant, and make more work to employ more men.

We cannot expect a man to give us his best efforts when he is in debt and has not enough to keep his family on.

If corporations are over-capitalized they must necessarily oppress labor to make a showing. But if they grow from small beginning, naturally, and stick to one legitimate product, balanced conditions are bound to follow.

The sooner men can be taught that labor is just as much of an asset, and more, than machinery and buildings, the sooner labor will be properly recognized.

In my judgment mere business is no objection if corporations are not over-capitalized.

We believe it is better, wiser and more just to make many men comfortable than to make a few very rich.

I have very little use for charities or philanthropies as such. My idea is aid to men to help themselves. Nearly all are willing to work for adequate reward. We have all kinds of cripples in our employ, and they are making good. We have a great many who have been in prison and who are outcasts from society. Every one of them is making a good showing and is gaining in self-respect and strength of character.

We will guarantee to take every man out of Sing Sing and make a man out of him.

Perkins on the Tariff

Other prominent industrial leaders and labor executives have been appearing before the commission. Geo. W. Perkins, when asked about the depression in the steel trade, denounced the tariff. "The country," he said, "will not continue under the present law. To it is due the depression in the steel industry, as well as in other industries. We need a tariff on a non-political basis." Mr. Perkins submitted a statement of the wages and hours of the employes of the United States Steel Corporation, and also gave statistics regarding the compensation, safety, pension and other welfare work conducted by it. Speaking on the broader aspects of business, Mr. Perkins said:

"I do not believe that competition is any longer the life of trade. Competition, driven to its logical end, gave us the sweatshop, child labor, long hours of labor, unsanitary labor conditions, and bred strife between employer and employee.

"For every ounce of trouble brought about in industry through the selfishness and cupidity of business men, a pound of trouble has been brought about through half baked laws and mutton-head legislation."

Daniel Guggenheim, president of the American Smelting & Refining Co., took a hopeful view of the labor situation. He said:

"I favor labor unions, because unionism sometimes helps the workers in disputes with capital and capital sometimes gets very arbitrary. Capital is becoming more humane. In addition we are getting better laws.

"Only when the federal and state governments take up the matter of the unemployed and the care of the unfit will conditions improve. This may sound socialistic, but these are my views."

Question From Drew Excites Gompers

Walter Drew, counsel for the National Erectors' Association, submitted to the federal commission on industrial relations, to be propounded to Mr. Gompers, who was testifying, the following question:

"If a union inflicts injuries on third persons unlawfully, by boycotting, or sympathetic strike, or violence, such as dynamite, would he not be legally liable for such injury in damages?"

The name of the questioner was not at first given and Mr. Gompers demanded to know who it was. When informed, he shouted: "I thought so!" and continuing, said: "Well, if a union inflicts any injuries unlawfully, it ought to be brought to the bar of justice, as any man; as for a boycott, or sympathetic strike, under the law of the United States, they are not unlawful."

Then he added: "The reference to dynamite is an insult and is intended as an insult. Anyone who uses dynamite should be sent to prison."

Labor Matters on Pacific Coast

Seattle, Jan. 25.—The Washington legislature now in session has not yet squared away on matters of labor legislation and it is not anticipated that there will be more than a normal amount of innovation in this regard. It is the consensus of opinion that matters having to do with eight hour questions will receive scant consideration. The action of the American Federation of labor on this point and the determined stand of employers in general against it will make it hard to arouse interest.

The industrial insurance commission is active and doubtless many proposed amendments will be introduced at its request. The commission asks authority to adjust the rates for all classes and to consolidate, divide or rearrange classes already established. Authority to make any changes in rates or in classes is reserved to the legislature at present. A second proposed amendment is to penalize the employer failing to submit his payroll.

The United Metal Trades Association and the Employers' Association of Washington are on the alert to prevent any too radical legislation and to see that the employers' liability law is amended by the proper kind of "first aid to the injured" clause, to contain a designated waiting period and other provisions that will prevent its bearing too heavily upon the industries.

The Employers' Association of Washington has passed a resolution commendatory of the decision by the United States Supreme Court in the Danbury hat case, the resolution stating in substance that it has initiated an era of industrial freedom and settles finally that under the Sherman law, unions are answerable for acts of conspiracy in restraint of trade and most important of all, it establishes the fact that when members of unions knowingly consent to unlawful acts on the part of their agents and leaders, they are individually responsible.

Business News from the Capital

Searching Questions as to Ownership of Ore Handling Properties—Chamber of Commerce of United States Will Hold Important Convention

Washington, Jan. 26.—Searching investigation of the ore rate structure obtaining from Lake Erie ports to furnaces in Pennsylvania, Ohio, West Virginia and Kentucky, and its practices is to be made by the interstate commerce commission. In a list of questions it has just distributed among the carriers made defendants, the commission seeks to learn all possible intercorporate relations that may exist between the railroads and the dock or terminal companies which are associated with the traffic.

It seems evident that an effort is being made to find out whether any of the large ore consumers, such as the United States Steel Corporation, are deriving advantages which are not enjoyed by smaller consumers.

The commission asks that the answers be submitted by Feb. 28, but in the event this cannot be done by any carrier, it is to notify Secretary McGinty. A preliminary hearing was begun on this case some time ago, but was postponed when the attorneys representing the shippers and the railroads could not agree as to its procedure. It is thought the hearing will be resumed in the near future.

Request for the information calls for six sets of figures to be bound and placed in such form that ordinary reading will give a view of any intercorporate relations that may exist. Statements are required to show whether the officers of any of the ore carrying roads are interested in the dock or terminal companies that handle the ore from the ships to the docks and thence to the railroad cars. The record is to cover six years, from Jan. 1, 1909, to Dec. 31, 1914.

Maps are to be submitted showing the parts of the railroads devoted to ore traffic, the ore docks and other facts as to facilities used in the business. The number of tons carried, the revenue of all freight, and that from ore alone, are to be supplied to denote the proportion of the ore traffic and its revenue. Assembling yards, terminals, and the method of operating the various parts of the plants used for ore carrying are to be shown in blue prints and maps.

The ninth and last question, divided into three parts, is particularly searching. It requires facts for the period from May 1, 1912, to Dec. 31, 1914. This question seeks to learn whether the carrier or any of its officers or directors owned, directly or indirectly, through lease or otherwise, all or any part of the iron ore docks, including the machinery for handling the ore and, if so, particulars as to docks and ownership or interest; whether the ore docks have been owned or leased by the carrier; whether they have operated directly or leased or sublet for operation by other parties; whether any carrier owned, leased or had any interest in any iron ore dock which was not operated during the whole period by it directly—that is, by its own employes who were paid daily wages or stated monthly salary; if arrangements for operation were made with other parties, all the contracts, agreements, etc., with regard to such contracts, are to be supplied.

Not Justified

Washington, Jan. 26.—The interstate commerce commission, in a reported opinion handed down last week, held as not justified, the proposed increase of railroads from 50 cents to 65 cents per gross ton on scrap iron and scrap steel in carloads between Joliet, Ill., and points in Indiana taking the Chicago rates. Typical of these points are Gary and Indiana Harbor. The carriers have also proposed a similar increase on the same commodities between Joliet and points in Illinois within the Chicago switching district, but the tariffs have been suspended by the public utilities commission of Illinois until February.

President Will Address Business Men

Washington, Jan. 26.—The Chamber of Commerce of the United States, which will hold its annual convention in this city on Feb. 3-5, inclusive, has set aside a special business session on the evening of the first day to hear an address by President Wilson. The President is expected to tell business men of his country the attitude of the administration toward business. Owing to the death of Mrs. Wilson, he will not attend the banquet to be given the evening of his address.

Because of the tremendous interest manifested in the pending ship purchase bill, now before the senate, and other vital topics to be discussed during this particularly momentous period of the country's history, the convention is expected to be more largely attended than ever before. Secretary McAdoo of the treasury department will voice the administration's views as to the ship purchase bill, while Senator Burton will present the views of those who are opposed to it. In addition, there will be a report of a special committee on merchant marine, of which William H. Douglas is chairman.

Secretary Bryan of the state department, on the afternoon of the first day, will speak on "American Investments Abroad", to be followed by Samuel McRoberts, vice president of the National City bank, New York, whose topic will be "The Federal Reserve Act in Relation to Trade Expansion". The merchant marine topic is to be discussed on the morning of Feb. 4, while on the afternoon of that day Joseph E. Davies, commissioner of the bureau of corporations, will speak on "The Federal Trade Commission". There will follow a discussion on the subject "How May We Secure Materials Needed in American Manufacture for Which We are Now Dependent on Foreign Countries?" Paul T. Chering, chairman, will submit a preliminary report of the special committee on maintenance of resale prices. Following this will be a discussion, led by Harry A. Wheeler, Chicago, on "Successful Methods of Commercial Organizations". At the annual banquet on the evening of Feb. 4, Secretary Redfield of the department of commerce will speak on the development of foreign commerce and Charles Sumner Hamlin, governor of the federal reserve board, will speak on the evolution of the federal reserve system. On the next and last day, there will be speakers, to be named, who will deal with the development of foreign commerce, and Dr. E. E. Pratt, chief of the bureau of foreign and domestic commerce, will discuss "Recent Work of the Bureau of Foreign and Domestic Commerce". E. A. Filene, vice president of the international congress of chambers of commerce, will speak on "Trade Expansion and the European War", while R. G. Rhett, chairman, will make a report of the special committee on trust legislation dealing with the ques-

tion, "Should Business be Free to Enter Into Combination for the Development of Foreign Commerce?"

Millions Have Been Confiscated

Washington, Jan. 26.—State department officials hope that congress will pass the Kahn bill, or a similar measure, which would prohibit the importation into the United States of any goods, wares or merchandise, the property of Americans and other foreigners in Mexico which have been confiscated by Mexican authorities. It was asserted that such a measure would prevent most of the confiscation from foreigners of cotton, copper, gold and silver bullion, etc., because it would take away the market in which the Mexicans have been selling these articles and securing American money to continue their campaigns. While there are no definite figures to show exactly what these confiscations from Americans, Spaniards and other foreigners have amounted to, it was declared at the state department that they have mounted into the millions, possibly $100,000,000 or more.

Rate Approved

Washington, Jan. 26.—An order has been entered by the interstate commerce commission authorizing the Alabama Great Southern and connections to establish a rate of $1.10 per net ton on coal and coke from the Birmingham, Ala., district to Meridian, Miss., without observing the long-and-short-haul provision.

Engineers' Officers

A. Stucki, consulting engineer, the Oliver building, Pittsburgh, has been elected president of the Engineers' Society of Western Pennsylvania for 1915. Other officers, elected at a meeting last week, are: A. L. Hoerr, steam engineer, National Tube Co., McKeesport, Pa., second vice president; William Hoopes, electrical engineer, Aluminum Co. of America, and Dr. John S. Unger, manager of the research laboratories for the Carnegie Steel Co., were elected directors.

E. M. Herr Predicts Better Times

E. M. Herr, president of the Westinghouse Electric & Mfg. Co., said better times are in store for employers and employes in this country at the second annual banquet of the Veteran Employes' Association of the Westinghouse company. The banquet, held Jan. 23, at the Fort Pitt hotel, Pittsburgh, was attended by 350 men and three women, all of whom had been in the service of the company for at least 20 years. R. L. Wilson acted as toastmaster, and talks were made by several members. Officers for the year were elected as follows: President, I. DeKaiser; vice president, C. G. Taylor; secretary, C. H. Long; treasurer, E. W. Davis; trustee, R. T. Wilson.

Sharp Decline

In Iron Ore Mining During Past Year in United States

The quantity of iron ore mined in the United States in 1914 is estimated to have been between 41,000,000 and 42,500,000 long tons, and the quantity shipped from the mines to receiving ports and iron-manufacturing centers between 39,500,000 and 41,000,000 long tons, according to Ernest F. Burchard, of the United States geological survey. These estimates are based on preliminary reports from 52 of the important iron-mining companies which represent the principal iron-producing districts and whose combined output in 1913 was more than 90 per cent of the total tonnage of iron ore mined in that year.

The average decrease in quantity mined by these 52 companies was 33 per cent compared with their output in 1913, and if this average decrease should hold for all the iron-mining companies in the United States the total output of iron ore in 1914 should approximate 41,440,000 long tons, compared with 61,980,437 long tons mined in 1913. A curve of iron ore production would therefore show the output of 1914 to be about on a par with that of the years 1905 and 1911. Coincident with the decrease of 33 per cent in ore mined the iron ore shipped from the mines by the same producers decreased also 33 per cent, and if the shipments for the whole country are figured on this basis the quantity of ore shipped should approximate 39,810,000 long tons, compared with 59,643,098 long tons shipped in 1913.

In the Lake Superior district, where about 85 per cent of the domestic iron ore is mined, the average decrease in production was about 37 per cent, thus indicating a total production for that district of about 32,915,000 long tons in 1914, compared with 52,518,158 long tons mined in 1913.

According to the preliminary reports the stocks of iron ore at the mines apparently increased more than 500,000 long tons during 1914, so that the total stocks at the close of 1914 should range between 13,400,000 and 13,500,000 long tons, compared with 12,918,633 long tons on hand at the close of 1913. These figures are, however, subject to greater uncertainty than the other estimates, because the returns to the survey are based largely on estimated data.

Award of Certificate of Merit

George P. Vanier, of Steelton, Pa., has been awarded a certificate of merit by the Franklin Institute, Philadelphia, for his potash bulb. This bulb has been particularly designed for use in the determination, in industrial laboratories, of the total carbon in iron and steel. In such laboratories time is often a very important factor. The bulb is of large capacity and, by the provision of a glass spiral in which the gases of combustion of the sample under test and the potash solution circulate together, a high rate of absorption of carbonic acid is obtained. With the bulb is combined a drying tube. Mr. Vanier is chief chemist of the Pennsylvania Steel Co., Steelton, Pa. He has also designed zinc tubes and sulphuric acid bulbs for use in connection with the Vanier combustion train for the determination of carbon in steel by direct combustion method with the electric furnace.

Ayer & Lord Tie Co. Addition

Chicago, Jan. 26.—The Ayer & Lord Tie Co., Chicago, is completing an addition to its plant at Carbondale, Ill., which will increase its capacity about 33 1/3 per cent. Two upright cylinders are being added which will make it a 10-cylinder plant. The increase will take care of creosoted blocks only.

The equipment has been bought, is being delivered and the plant is expected to be in full operation within 45 days. This concern has just finished laying 3,500 square yards of creosoted block flooring in the plant of the Reo Motor Co., at Lansing, Mich.

The American Manganese Mfg. Co., which operates a plant at Dunbar, Pa., will open its Freeport coal mine in the near future. The mine will help to supply coal for the by-product coke plant operated in connection with the blast furnace plant.

Work of reconstructing No. 2 stack of the Andrews & Hitchcock Iron Co., at Hubbard, O., is progressing rapidly. The furnace, which is being built under the supervision of Julian Kennedy, Pittsburgh, will have a daily capacity of 500 tons.

New Buildings

Planned for Detroit—Auto Industry is Fairly Active

Detroit, Jan. 26. — Indications point to a heavy building season in Detroit. In 1914 a number of immense structures were pointed toward the sky; in 1915 it is thought that work will be as heavy. Preparations have already been made for the building of a 23-story addition to the Penobscot building, while structures of lesser magnitude will be put up over nearly every part of the business district.

A block at Woodward and Gratiot avenues—in the center of the downtown district—will be torn down and replaced with a larger building; another business block will be erected at Woodward avenue and Watson streets, in the new up-town section. This district is rapidly growing.

Factory construction work has been given a start by the Hupmobile company, which is erecting four buildings to approximate a cost of $150,000. The buildings include a two-story office structure, 1,800 x 300; a top and body building, 1,500 x 300; a testing laboratory, 350 x 200, and an engineering building, 200 x 300. All men employed in the construction work are directly employed by the motor car company and the firm built now, rather than in the spring, to furnish employment for men who otherwise would have been laid off.

Motor car companies throughout the city are running fairly strong and the indications are that business will be shown on a larger scale with the starting of spring. The Ford Motor Co. is running with practically a complete force, it being estimated that 14,000 men are now given employment at this works. The Dodge Motor Co. has not taken up operations on a very active scale as yet, but the concern expects to break into the field soon.

A New Industry.—The American Mfg. Co., Chattanooga, Tenn., by taking over the plant and equipment of the Owensboro, Ky., Shovel Co., will add an industry to the Dynamo of Dixie list, although there will be no separate organization. The American Mfg. Co. has heretofore made an extensive line of hardware specialties, but shovels are a new product for it and for Chattanooga. Negotiations to the end that the shovel department be added have been under way for some months between the Kentucky concern and President J. B. Robinson, of the company named, in conjunction with the industrial board of the chamber of commerce. The industrial board has been instrumental in securing several new industries, such as the American Hame & Singletree Co., Chattanooga Stamping & Enameling Co., and the shovel factory.

Will Build Big Bridge

Philadelphia, Jan. 26.—The Cumberland Valley railroad, it is officially announced, will within a short time start work on a modern arch bridge to replace its present steel deck truss bridge over the Susquehanna river at Harrisburg, Pa. The new bridge will cost approximately $750,000. This will be the first construction work of any magnitude, to be undertaken by any of the lines of the Pennsylvania system for more than a year.

The bridge over the Susquehanna river at Harrisburg, which the Cumberland Valley railroad now is using, is a single-track structure of 25 spans, supported by stone piers. The proposed bridge will have 46 spans and will carry two tracks. The bridge will be 4,000 feet long.

In connection with the construction of the new bridge, the Cumberland Valley railroad will build undergrade crossings at Front and Second streets in the city of Harrisburg.

Looking for a New Home

Trenton, N. J., Jan. 26.—The Engineers' Club, of Trenton, has appointed a committee to look for a site for a new home. The club has more than 200 members, many of them being prominent engineers of various parts of New Jersey and New York City. At a recent meeting, Dr. Henry B. Kummel, state geologist, gave an illustrated lecture on "The Geology of Trenton in Relation to Commercial Development and Engineering Problems".

Finley yards, the new railroad yards being constructed by the Southern railway at North Birmingham, Ala., was placed in use by that company last week. These yards, when finally completed with shops, round house, etc., will represent an investment of $1,000,000. They have been named after the memory of the late W. W. Finley, president of the Southern.

During 1914, 10 new industries were established in Pittsburgh, as a direct result of the efforts of the Pittsburgh industrial development commission, according to the third annual report of the commission, recently issued. Thirty new industries have been established in Pittsburgh by the organization the last three years.

Scholarship

Made Available to Americans By Carnegie Endowment

G. C. Lloyd, secretary of the Iron and Steel Institute, has announced in this country the conditions which will apply to the award by that organization, of the Andrew Carnegie research scholarship or scholarships. Mr. Carnegie, who is a past president of the Iron and Steel Institute, has presented the organization the sum of $100,000 as the foundation for this scholarship, which is to be awarded annually, irrespective of sex or nationality, on the recommendation of the council of the institute. Candidates, who must be under 35 years of age, are obliged to apply on a special form before the end of February, to the secretary of the institute.

The object of this scheme of scholarships is not to facilitate ordinary collegiate studies, but to enable students, who have passed through a college curriculum or have been trained in industrial establishments, to conduct researches in the metallurgy of iron and steel and allied subjects, with the view of aiding its advance or its application to industry. There is no restriction as to the place of research which may be selected, whether university, technical school, or works, provided it be properly equipped for the prosecution of metallurgical investigations.

The appointment to a scholarship shall be for one year, but the council may at their discretion renew the scholarship for a further period instead of proceeding to a new election. The results of the research shall be communicated to the Iron and Steel Institute in the form of a paper to be submitted to the annual general meeting of members, and if the council consider the paper to be of sufficient merit, the Andrew Carnegie Gold Medal shall be awarded to its author. Should the paper in any year not be of sufficient merit, the medal will not be awarded in that year.

The Bulletin of the American Iron and Steel Institute says as to the announcement:

"The attention of clever young people connected with the iron and steel industry is invited to the announcement. There is so much talent among our young men and women that it would not be at all surprising if one or more of these Carnegie medals should be brought to this side of the ocean."

The Clarage Foundry & Mfg. Co., Kalamazoo, Mich., has changed its name to the Clarage Fan Co.

War Contraband

Government Withdraws Proclamations and Issues Revised List

A proclamation revising the list of articles to be treated as contraband of war has been issued recently by the government, in consequence of which all previous proclamations on the same subject have been withdrawn. The articles enumerated in Schedule I will in future be treated as absolute contraband, and the articles mentioned under Schedule II will be considered as additional contraband.

Schedule I.

Arms of all kinds, including arms for sporting purposes, and their distinctive component parts.

Projectiles, charges and cartridges of all kinds, and their distinctive component parts.

Powder and explosives specially prepared for use in war.

Ingredients of explosives, viz., nitric acid, sulphuric acid, glycerine, acetone, calcium acetate and all other metallic acetates, sulphur, potassium nitrate, the fractions of the distillation products of coal tar between benzol and cresol inclusive, aniline, methylaniline, dimethylaniline, ammonium perchlorate, sodium perchlorate, sodium chlorate, barium chlorate, ammonium nitrate, cyanamide, potassium chlorate, calcium nitrate, mercury.

Gun mountings, limber boxes, limbers, military wagons, field forges, and their distinctive component parts.

Armor plates.

Ferro-alloys, including ferro-tungsten, ferro-molybdenum, ferro-manganese, ferro-vanadium, ferro-chrome.

The following metals:—Tungsten, molybdenum, vanadium, nickel, selenium, cobalt, hematite pig iron, manganese.

The following ores:—Wolframite, scheelite, molybdenite, manganese ore, nickel ore, chrome ore, hematite iron ore, zinc ore, lead ore, bauxite.

Aluminum, alumina and salts of aluminum.

Antimony, together with the sulphides and oxides of antimony.

Copper, unwrought and part wrought, and copper wire.

Lead, pig, sheet or pipe.

Barbed wire, and implements for fixing and cutting the same.

Warships, including boats and their distinctive component parts of such a nature that they can only be used on a vessel of war.

Motor vehicles of all kinds and their component parts.

Tires for motor vehicles and for cycles, together with articles or materials especially adapted for use in the manufacture or repair of tires.

Rubber (including raw, waste and reclaimed rubber) and goods made wholly of rubber.

Iron pyrites.

Mineral oils and motor spirit, except lubricating oils.

Implements and apparatus designed exclusively for the manufacture of munitions of war, for the manufacture or repair of arms, or war materials for use on land and sea.

Schedule II.

Vehicles of all kinds, other than motor vehicles, available for use in war, and their component parts.

Vessels, craft and boats of all kinds, floating docks, parts of docks, and their component parts.

Railway materials, both fixed and rolling stock, and materials for telegraphs, wireless telegraphs and telephones.

Fuel, other than mineral oils. Lubricants.

Powder and explosives not specially prepared for use in war.

Horseshoes and shoeing materials.

Weirton Plant Taken Over

The Weirton Steel Co., Weirton, W. Va., manufacturer of strip steel, has been taken over by the Phillips Sheet & Tin Plate Co., which operates plants at Weirton and Clarksburg, W. Va., and at Steubenville, O. The two companies had been closely connected. Improvements are contemplated at the Weirton Steel Co. plant.

Left Large Estate.—Lyman F. Gordon, president and treasurer of the Wyman & Gordon Co., Worcester, Mass., and Cleveland, who died at his home in Grafton, Mass., Dec. 20, left an estate of an estimated value of $2,000,000, most of which is in personal property. The will bequeaths his estate to his wife, who is made residuary legatee, after making small bequests to his two sons, Winfield and Forrest. No changes have been made in the corporation since the death of Mr. Gordon and none is expected until the annual meeting when Mrs. Gordon will probably be made a director and George F. Fuller, secretary and general manager, advanced to the presidency.

The Pope mill of the Phillips Sheet & Tin Plate Co., at Steubenville, O., has renewed operations. Six of the 12 mills now are operating. The plant has been idle several months.

Large Gains

Made in Exports of Wire, Horseshoes and Machine Tools

Iron and steel exports for November, for which statistics collected by the Bureau of Foreign and Domestic Commerce have just become available, were 140,729 tons, compared with 175,975 tons in November, 1913. There were, however, increased exports of barbed wire, of which 17,791 tons were exported in November this year, compared with 7,428 tons in November, 1913, and also in plain wire and horse shoes. The imports of products reported on a tonnage basis show little change.

Of automobiles, 842 trucks were exported last November, compared with 64 in November, 1913. Of passenger automobiles, 776 were exported last November, compared with 1,707 in November, 1913. In metal working machinery, including machine tools, the value of the exports last November was $1,871,171, compared with $809,287 in November, 1913.

IRON ORE IMPORTS, NOVEMBER.

	Tons, 1914.	Tons, 1913.
Spain	.....	6,208
Sweden	5,134	25,896
Canada	4,258	27,109
Newfoundland and Labrador	.....	12,000
Cuba	65,930	106,872
Other countries	14,900	1,642
Total	90,222	179,727

IRON AND STEEL IMPORTS, GROSS TONS.

	November.		Eleven months ending November.	
	1914.	1913.	1914.	1913.
Scrap	3,830	2,754	32,753	42,841
Pig iron	11,425	13,761	135,225	144,001
Ingots, blooms, slabs, billets of steel, n. e. s.	2,790	3,308	38,347	23,865
Wire rods	918	1,279	6,875	15,158
Rails	2,339	1,621	22,320	8,766
Bar iron	790	2,302	15,261	26,914
Structural	1,212	465	10,050	10,617
Sheets and plates	497	117	4,241	2,702
Tin and terne plate	364	202	15,179	15,939
Total	24,165	25,809	280,251	290,803

IRON AND STEEL EXPORTS, GROSS TONS.

	November.		Eleven months ending November.	
	1914.	1913.	1914.	1913.
Scrap	1,334	11,334	31,623	89,740
Pig iron	10,139	18,353	107,677	252,208
Billets, ingots and blooms of steel	7,033	1,052	47,066	89,615
Wire rods	7,109	1,032	54,420	54,229
Steel rails	9,283	24,911	171,113	438,035
Steel bars	12,324	15,873	101,001	196,803
Iron bars	462	2,508	4,842	15,963
Structural iron and steel	11,146	35,802	171,637	378,510
Hoop, band and scroll	1,500	1,261	9,247	15,398
Sh'ts & plates	21,026	21,224	262,763	436,481
Tin and terne plates	4,837	2,500	55,570	55,420
Barbed wire	17,791	7,428	85,512	74,184
All other wire	10,436	8,397	74,544	99,372
Cut nails	58	250	3,286	3,402
Wire nails	4,895	2,593	32,249	40,574
All oth. nails, including tacks	321	278	2,876	3,610
Pipes and fittings	18,498	18,886	187,953	280,086
Railr'd spikes	321	451	6,769	10,748
Bolts, nuts, rivets, washers	751	1,469	14,071	20,851
Horse shoes	1,263	110	4,216	1,133
Cast radiators	202	263	3,300	7,574
Total	140,729	175,975	1,431,735	2,563,936

Home Demand, Not "War Orders"

Keep Markets Fairly Active—Lack of Railroad Buying a Feature—Increased Inquiries Encourage Chicago District—Foreign Demand Good

THE MACHINERY market in the east was fairly active last week. While fewer new inquiries came out, a good volume of business was placed, and it is particularly satisfactory to note that an increasing portion of current business is coming from domestic consumers who have not booked "war orders". Most of this domestic business, however, is in small lots, involving one, two or three tools. The lack of demand from the railroads is significant, but there are indications that these interests will be in the market shortly. Among prominent buyers last week was the Massillon Rolling Mill Co., Massillon, O., which purchased about $20,000 worth of equipment, mostly machine tools. The E. W. Bliss Co., Brooklyn, N. Y., bought some 25 out of the 50 lathes recently inquired for and is in the market for the balance. The Winchester Repeating Arms Co., New Haven, Conn., is reported to have closed for a large number of machine tools and continues in the market. The Remington Arms Co., Ilion, N. Y., and the Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn., have bought considerable additional machinery. The city of Orange, N. J., received bids on five additional machine tools on Jan. 25 and is expected to close shortly for the entire 16 on which bids have been taken. The Lake Torpedo Boat Co., Bridgeport, Conn., has bought a few tools. The government last week closed for three cranes for the Pearl Harbor naval station. G. Amsinck & Co., 6 Hanover street, New York City, have put out a list of six tools for export. Westinghouse, Church, Kerr & Co., 37 Wall street, New York City, are taking bids on a small crane for the Winchester Repeating Arms Co.'s plant, New Haven, Conn. Demand from abroad continues good, but not as active as about two weeks ago; a feature is the improved demand from Sweden. Some large inquiries for iron and steel works equipment are expected from China shortly.

While sellers of machine tools in the Chicago territory have not found an increase in their sales, there is here and there an increase in inquiry, which is some encouragement for future business. Railroads continue to remain consistently out of the market and dealers find they cannot obtain any assurance that buying will be done in the near future. Manufacturers of machinery are somewhat busier; export business has been sublet by some plants which have taken on more than they can finish within contract time; other makers have thus gained considerably in activity. The Gisholt Machine Co., Madison, Wis., has taken an order from the Bethlehem Steel Co. for turret lathes, which are to be exported to England. This has caused overtime operations in part of the plant. The Ingersoll Milling Machine Co., Rockford, Ill., has booked some large orders and is working almost full force with a portion of the plant on overtime. The Rockford Drilling Machine Co., at the same place, has booked ahead for several months and has had to turn down an offer from a Cincinnati builder to contract for its entire output. Dealers believe that until general business improves to the point that plants now largely idle resume operations more nearly equal to capacity, the demand for additional equipment will continue light.

In Cincinnati, orders for machine tools placed during the past week have not been equal to those of the preceding three or four weeks. Demand from Europe has fallen off considerably, but several good contracts have been placed in Canada for lathes, which, it is reported, will be sent to England. Several makers of lathes, who were very busy a month ago, are now barely running full time, and, taken as a whole, it appears as though the situation has slowed down. The Hamilton Machine Tool Co. has been placed in the hands of a receiver, one of the statements in the application being that the company was unable to secure sufficient orders during the present dull period. A few of the larger manufacturers of lathes in this city are running full time, and report that they are not able to produce their tools fast enough to meet the European demand. H. Reevier, of Paris, is in the city at the present time to buy machinery, and is visiting local shops for that purpose. Milling machines have picked up a little in sales in the past two weeks, but are not as yet selling as well as lathes or radial drills.

EASTERN STATES

PORTLAND, ME.—Calumet Corbin Mines Co. has been incorporated to deal in mineral products and by-products; $2,500,000 capital stock; Albert F. Jones, president; James E. Manter, clerk; T. L. Croteau, treasurer.

BOSTON.—The Sturtevant Mill Co. is considering the erection of an addition.

BOSTON. — W. J. McDonald, 95 Milk street, is contemplating the erection of a 6-story and basement factory building.

NEW HAVEN, CONN.—National Folding Box & Paper Co. will erect a 100 x 350-foot factory on James street.

NEW HAVEN, CONN.—Fire partly damaged the plant of the Winchester Repeating Arms Co.

NORWICH, CONN.—Cudworth & Woodworth, 148 Main street, are drawing the plans for a four-story factory to be erected on West Main street.

TORRINGTON, CONN. — The Splitdorf Electrical Co., which has booked large contracts for the manufacture of high tension magneto ignition systems, is planning to enlarge its capacity.

BAYWAY, N. J.—Waclark Wire Co. has let the contract for a one-story addition to cost $40,000, to be built from private plans.

BROOKLYN.—Gotham Metal Works, stamp and spin metal goods, have been incorporated; $25,000 capital stock; by F. Weinberg, C. F. Frank, M. Tuscano.

BUFFALO. — Jacob Moschel's Sons, 153 Peckham street, have let the general contract for a 28 x 36-foot boiler house.

JAMESTOWN, N. Y.—Crescent Tool Co. will build a three-story, 60 x 150-foot addition, in the spring.

KINGSTON, N. Y.—Frank McGarrett, iron, steel and copper, has been incorporated; $5,000 capital stock; G. M. McGarrett and Frank McGarrett, East Orange, N. J.; A. C. Connelly, Kingston.

LESTERSHIRE, N. Y.—Endicott-Johnson Co., Endicott, N. Y., will build a four-story, 60 x 200-foot storage building in Lestershire.

LONG ISLAND CITY, N. Y.—Ford Motor Co., Detroit, has let a contract for the erection of an eight-story, 209 x 325-foot, automobile service plant here.

LONG ISLAND, N. Y.—It is reported bids will be opened at Washington, Feb. 27, for a high-powered radio installation for the navy's new Chollas Heights station on Long Island.

NEW YORK.—Oakland Machine Co. has been incorporated; $10,000 capital stock; by A. C., and Niles Oakland, Pearl river.

NEW YORK.—G. Amsinck & Co., importers, 6 Hanover street, are inquiring for bids on six or seven machine tools.

NEW YORK.—Peerless Automatic Machine Co., 395 Broadway, has increased its capital stock from $30,000 to $100,000.

NEW YORK.—Westinghouse, Church, Kerr & Co., 37 Wall street, are asking bids on a small crane to be installed at the Winchester Repeating Arms Co. plant, New Haven, Conn.

NEW YORK.—United Electric Light & Power Co. in which Mr. McCoy, 130 East Fifteenth street, is interested, has let a contract for a five-story, 20 x 100-foot substation.

NEW YORK. — F. V. F. Machine Works have been incorporated; $2,100 capital

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The illustration above shows an installation of **Ayer & Lord Interior Wood Blocks** in the Sorting and Shipping Room of the **Acme Foundry Company**, Cleveland, Ohio.

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You cannot buy insurance that will **PREVENT** your property from destruction, so **AGAIN** you do the next best thing—you buy insurance that will recompense you for your loss.

You cannot buy insurance that will prevent the flooring of your plant from wearing out—**BUT,**

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KANSAS CITY, MO.—1117 Rialto Bldg.
MEMPHIS, TENN.—1402 Exchange Bldg.
PHILADELPHIA, PA.—319 Perry Bldg.

stock; by Otto Flade, Theodore Schultheis, 1511 Third avenue; et al.

NEW YORK, N. Y.—Yankee Heavy Oil Motor Co. has been incorporated; $50,000 capital stock; by Edward J. Dooling, Brooklyn; James A. Clynes, Jersey City, N. J.; et al.

NEW YORK.—Guiman Contracting Corporation has received its charter; $10,000 capital stock; T. F. McLaughlin, B. P. and Daniel Guiman, 73 Third street, Brooklyn; incorporators.

NEW YORK.—Newton Mfg. Co., electrical appliances, dynamos, motors, has been incorporated; $25,000 capital stock; by W. R. H. Hardingham, P. Sinnott, Bruce M. Falconer, 701 Madison avenue.

NEW YORK.—Nineteenth Street & Broadway Corporation, construction and realty, has received its charter; $300,000 capital stock; Robert Conner, T. F. Kennedy, F. O. Robertson, 165 Broadway, incorporators.

NEW YORK.—Plants of the Braun Machine Works, the Mutual Lamp Mfg. Co. and the Rapid Addressing Machinery Co., located at 413-415 West Broadway, were damaged by fire.

ROCHESTER, N. Y.—Fire slightly damaged the Rochester Power Co.'s plant.

SYRACUSE, N. Y. — Pierce, Butler & Pierce Corporation has let the contract for construction of two-story pattern shop.

WESTMORELAND, N. Y.—Core room of the Westmoreland Malleable Iron Co. was damaged by fire.

ALTOONA, PA.—Atlantic Refining Co. will erect a $20,000, 52 x 80 foot, reinforced concrete building.

BEAVER, PA.—John W. Reid, Colona, Pa., Edward Thomas and others, of Monaca, Pa., have incorporated at $250,000, and will seek a franchise for an electric line to make direct street car connections between East Liverpool, O., and Pittsburgh; they propose to construct a line from Monaca to Aliquippa, Pa., where a connection will be made with the Woodlawn & Southern Railway Co., and from another connection, near South Heights, on through to Corapolis, Pa.

MIDLAND, PA.—Pennsylvania lines will spend $500,000 before May 1 in doubling C. & P. yard capacity and making other improvements in Midland.

PHILADELPHIA.—Day & Klauder, architects, will be ready for bids about the first week in February for the Ed. J. Schoettle Co.'s eight-story, 92 x 150-foot, reinforced concrete and brick factory building.

PHILADELPHIA. — Samuel J. Cresswell Iron Works will add a third story to its present building and erect a two-story, 50 x 110-foot addition; Ballinger & Perrot are the engineers.

PHILADELPHIA. — Wm. Cramp & Sons Ship & Engine Building Co. has acquired additional property at the northwest corner of Richmond and Dyott streets, 400 x 465 feet; a three story brick machine shop is located on the property.

SHARON, PA.—Sharon civic association has recommended a concrete bridge across the Shenango river to replace the old State street structure; if this petition is rejected a two-truss bridge will be asked.

CLIFTON, N. J.—Plant and machinery of Alaska Novelty Co. damaged by fire.

DOVER, N. J.—E. F. Quirke, representing the Brooklyn Bolt & Forging Co., Brooklyn, contemplates moving this business to Dover and is seeking a site here; this company manufactures bolts and crossarms for telephone and telegraph poles.

JERSEY CITY, N. J.—Acer-Burger Mfg. Co. has been incorporated to deal in zinc and scrap metals; $250,000 capital stock; by J. I. Turner, L. H. Gunther, C. H. Jarvis, Jersey City.

NEWARK, N. J.—Delaware Tire & Rubber Co., manufacturer, has been incorporated; $125,000 capital stock; by B. C. Cohn, Newark; R. S. Harding, W. E. Turlon, Irvington, N. J.

RIVER EDGE, N. J.—Tidewater Mill & Lumber Co. has been incorporated; $100,000 capital stock; by A., E., and O. M. Hughs.

TRENTON, N. J.—John A. Roebling's Sons' Co. plans to replace its burned insulated wire department by smaller buildings, to be erected on the present site in South Trenton.

NEWPORT, DEL. — Lightwell Steel Sash Co., a new industry, is about to locate here for the manufacture of steel sash and kindred products; S. F. Gonsolus and J. Ralph Baily, Wilmington, are interested.

HAGERSTOWN, MD.—Three large buildings, housing engine and machinery at the plant of the Potomac Valley Stone & Lime Co. were badly damaged by fire.

WASHINGTON, D. C.—Bureau of supplies and accounts, Navy department, Washington, will open bids, Feb. 9, for a 30-foot plate shaper to cost approximately $10,000 for the Norfolk navy yard; on the same day for a horizontal milling machine for the Washington navy yard.

CENTRAL STATES

AKRON, O.—Falls Rubber Co. has increased its capital stock from $200,000 to $300,000.

AKRON, O.—F. W. Rockwell, mayor, says a $600,000 bond issue will be voted upon; $100,000 is planned for laying 20 miles of water mains, and $500,000 for the completion of the new water works.

ATHENS, O. — State armory board, of which Capt. S. M. Johnson is a member, will receive bids until early in March for the erection of the state armory in Athens.

BELLEVUE, O.—Carl P. Klein has purchased a two-acre site for a 60 x 160-foot structure, to be erected of hollow building blocks, for the Twine Iron & Steel Co.; the company will have a capital of $15,000 and will equip the building with modern machinery for iron and steel construction.

BUCYRUS, O.—Bucyrus Light & Power Co. will issue $58,000 bonds for improvements and additions to the plant.

CANTON, O.—Secretary Leonard, county commissioner, said the county will build one of the two bridges to be erected on Allen avenue and Eighth street, but that it is not decided which one.

CHILLICOTHE, O.—Mead Pulp & Paper Co. has increased its capital stock from $500,000 to $600,000.

CINCINNATI.—Bids will be taken in about two months for motor-driven pumps for the water works system of Newport, Ky., a suburb.

CINCINNATI.—Norwood, a suburb, will need some light electrical equipment for its electric lighting plant; a 110-volt alternating current will be used in the future instead of the present 220-volt direct current.

CINCINNATI—Elzner & Anderson, architects, will start preliminary plans at once for the proposed Y. M. C. A. building, to cost about $500,000; bids will probably be asked within a few weeks.

CINCINNATI.—Light equipment, for repairing automobiles, will be required by George R. Balch, who will erect a garage building containing 21,600 square feet of floor space, near Race and Court streets.

CINCINNATI.—Committee on streets and parks has submitted a bond ordinance of $165,000 for the proposed concrete viaduct over Kemper lane, at Park avenue; plans have been prepared by Assistant Engineer Raschig.

CINCINNATI.—Butt Joint Nestable Culvert Co. recently incorporated at $50,000 to manufacture corrugated iron culverts, will equip a factory building on Reedy street; the territory covered from Cincinnati will embrace all of the central states.

CLEVELAND.—Iceless Machine Co., manufacturer, has been incorporated; $1,000 capital stock; by H. A. Hauxhurts, R. H. Jamison, V. Svancara, I. W. Sharp, Richard Inglis.

CLEVELAND.—Acme Bed Spring Co., manufacturer, has been incorporated; $5,000 capital stock; by S. H. Katz, Abraham, Marge Megathey, Noah Mendelson, I. S. Feit.

CLEVELAND.—F. D. Richards, city bridge engineer, will ask for bids in about three weeks for approximately 9,000 tons of steel for the east section of the proposed Clark avenue viaduct.

CLEVELAND. — Walther Engineering & Construction Co. has been incorporated; $10,000 capital stock; by A. F. Walther, G. E. Bradbury, E. A. Binyon, A. H. Fishbach, J. L. Bushea.

CLEVELAND. — Boiler room and pattern storage house of the American Ship Building Co. was badly damaged by fire; George Waterbury, superintendent, estimates the loss at $10,000.

CLEVELAND. — United Paper Box Co., manufacturer, has been incorporated; $10,000 capital stock; by M. W. Kastriner, N. R. Sweetcorn, Arthur Elsner, Mary Coleman, Ben Feniger.

CONNEAUT, O.—C. A. White Co., contractor, has been incorporated; $10,000 capital stock; by C. A. and G. M. White, E. W. Singer, et al.

DAYTON, O.—Ritchie-Hertz Co., cabinet builder, will erect a $5,000, one-story brick factory building on South Perry street.

DAYTON, O.—Dayton Pump & Mfg. Co. will make several changes in its factory shortly, which will add to its manufacturing facilities; the company recently increased its capital stock from $100,000 to $375,000.

DAYTON, O.—Linder Bros., sanitary milk company, have adopted plans for a $10,000 addition to be used as a power plant, and to house additional machinery; an appropriation also has been made for the purchase of new equipment, including ice making machinery, a 30-horsepower gas engine, etc.; C. H. Linder, president.

DELPHOS, O.—Mueller Implement & Auto Co. has increased its capital from $75,000 to $125,000.

FINDLAY, O.—The Findlay Iron & Coal Co. is offering for sale the plant and equipment of a 3½ acre scrap yard with brick building, two large shears, gas engines, pipe shop and about 3,000 tons of iron.

FINDLAY, O.—Electric Construction & Motor Co. which recently increased its capital stock from $15,000 to $30,000, will erect a $5,000, two-story addition as soon as weather permits.

LANCASTER, O.—Kyle Mfg. Co. has moved its plant to this city from Washington Court House, O., and will have its stove plant in operation in about a month; almost all additional equipment has been purchased.

MASSILLON, O. — Enterprise Aluminum Co., recently incorporated, is temporarily established in one of the buildings of the Massillon Rolling Mill Co.; the company expects eventually to equip a plant of its own; R. E. Bebb, Canton, O., president.

PORTSMOUTH, O.—Raymond York says the Portsmouth Street Railway & Light Co. will start the erection of a $25,000, brick car barn early in the spring.

SANDUSKY, O.—M. H. Joy, president of the Ohio Engine Co., has decided definitely to locate his plant in Sandusky; concern will manufacture gas engines.

SPRINGFIELD, O.—T. A. Graham has started work on a four-story, 50 x 260-foot,

reinforced concrete addition to the Kelly Motor Truck Co.; this will be the second addition to be erected by this company within the past six months.

SPRINGFIELD, O. — Plans, being drawn by W. R. Russ, architect, for a fireproof building for the Robins & Myers Co., will be ready the first week in February; the structure will be one and two stories, the two-story section to be 100 x 100 feet and the foundry 60 x 275 feet; the original plans which called for two buildings have been changed.

TOLEDO.—Citizens Ice & Cold Storage Co. has increased its capital stock from $100,000 to $200,000.

TOLEDO, O.—Arrangements are being perfected to carry out the plans of the Willys-Overland Co. to build a bridge at the northeast Boulevard entrance in return for a right of way across the property.

TOLEDO, O.—Banting Mfg. Co., farm implements, has been incorporated; $400,000 capital stock; by C. C. Banting, J. F. Sanders, John Auxter, W. F. Horton, J. W. Banting.

TOLEDO, O.—City Engineer McKechnie in conjunction with the engineers of the Ann Arbor railroad and the Wheeling & Lake Erie, will make plans for the north end viaduct across the marsh, connecting the ends of Magnolia and Mulberry streets.

WELLSVILLE, O.—Universal Vacuum Seal Co., manufacturer, has been incorporated; $100,000 capital stock; by John Diemer, George and F. A. Sinclair, Silas Menough, Joseph Diemer.

ZANESVILLE, O.—Commissioners will be asked to take action at once regarding the erection of a two-track, steel bridge across the Muskegum at Third street; plans have been prepared by County Engineer Strait.

LOUISVILLE, KY.—Aherns & Ott Mfg. Co. has placed the limit of its liability at $750,000.

STITHTON, KY. — Stithton Lighting Co. has been incorporated; $3,000 capital stock; by C. H. Aubery, L. J. Metcalf, G. H. Greenup.

ANDERSON, IND.—Fire badly damaged the foundry of the American Rotary Valve Co.; it is expected the building will be reconstructed shortly.

ATTICA, IND.—Shawnee Mfg. Co., of Indiana, has been incorporated to manufacture farming tools and machines; $20,000 capital stock; by C. A. Lyons, J. A. Spangler, J. M. Washburn.

HUNTINGTON, IND. — Northwestern Needle Co., Minneapolis, Minn., will be moved to Huntington where it will be operated under the name of the United States Needle Co.; the concern was purchased for about $100,000 by Chicago and Indiana capitalists, headed by Charles E. Johnson, Chicago.

INDIANAPOLIS.—Auto-Matic Lighter Co. has been incorporated to manufacture automobile accessories; $10,000 capital stock; by C. E. Haviland, E. W. Infield, O. J. Bowlder.

SOUTH BEND, IND.—Parcel Post Scale Co. has been incorporated to manufacture scales; $60,000 capital stock; by C. L. Kimball, Emerson B. Priddy, W. Kimball.

ALTON, ILL.—After the sale of the Alton steel plant is held and organization effected $150,000 will be spent to remodel it and put it in operation within a short time.

BLOOMINGTON, ILL.—Trott & Stubblefield Co. has been incorporated to manufacture automobile and motor trucks; $20,000 capital stock; by E. C. Trott, L. W. Stubblefield, D. O. Hemenover.

CHICAGO.—S. & S. Automatic Grate Co., 844 West Sixty-third street, has increased its capital from $15,000 to $60,000 and its directors from three to five.

CHICAGO.—Magnus Company has been incorporated to manufacture and deal in metals and metal products; $5,000 capital stock; by Wm. H. Clark, M. F. Kennedy and Paul R. Winegardner.

CHICAGO.—Safety Water Heater Co. has been incorporated to manufacture water heaters and stoves; $20,000 capital stock; Henry A. Gano, Herman Wagner, Thomas L. Stitt, 10 South LaSalle street.

CHICAGO.—Pondelick Piston Ring Co. has been incorporated to manufacture machinery, motors and metallic piston rings; $30,000 capital stock; by L. Pondelick, C. Pondelick, A. A. Landry, 3853 Rokeby street.

CHICAGO.—Hunter Auto Supply Co. has been incorporated to manufacture automobiles and accessories; $30,000 capital stock; by Robert H. Farrell, Chas. R. Francis and Wm. A. Bither, 111 W. Monroe street.

CHICAGO.—Andrews Engineering Co. has been incorporated to build and deal in bridge operating machinery and iron and steel castings; $10,000 capital stock; by J. H. Straus, Wesly W. Hawley and Martin Andrews.

CHICAGO.—Winslow Safety Boiler Co. has been incorporated to manufacture steam boilers, power machines, engines and motors; $5,000 capital stock; by Percy B. Eckhart, Thomas G. Deering, Roy O. West, 38 South Dearborn street.

CHICAGO.—Armour Grain Co. is planning to build a grain elevator on the Calumet river, at 118th street, at a cost of $4,500,000. It will contain two workhouses, each 100 x 350 feet and 200 feet high, 224 grain tanks of concrete, a power plant 80 x 150 feet to develop 6,000 horsepower, a train shed with six tracks, 50 x 400 feet, of structural steel covered with corrugated iron.

HOOPESTON, ILL. — Briggs Automatic Gate Co. has been incorporated to manufacture engines, machinery, gates, etc.; $5,000 capital stock; by C. M. and Jay Briggs, Walter T. Gunn; Briggs & Briggs, attorneys, Hoopeston.

JOLIET, ILL. — Machinery Specialty Co. has been incorporated to manufacture and deal in steel, iron and other metals; $10,000 capital stock; Louis B. Mather, Henry J. Bates and Nina Bates.

JOLIET, ILL.—Joliet Foundry Co. has been organized to occupy the Enterprise foundry site on South Bluff street and operations are expected to begin March 1. E. B. Clark, formerly superintendent of the Buda Foundry Co., at Harvey, Ill., is the organizer.

PEORIA, ILL.—Peoria Tractor Co. has been incorporated to manufacture tractors, tractor engines, etc., $60,000 capital stock; by Geo. McFarland, C. F. Loomis and E. M. Smith.

SANDOVAL, ILL.—A joint partnership has been formed by W. G. Keller, E. Siple and G. Tadich for the establishment of a brass foundry to specialize in the manufacture of brass ingots and castings and zinc refining.

CLARE, MICH.—Mayor W. L. Adams and City Engineer White will recommend to the council that the city purchase what is known as the Dam property for generating power for a municipal lighting plant; Consolidated Light & Power Co. has the contract now for lighting the city.

DETROIT.—Scripps Motor Co. has been incorporated; $250,000 capital stock; by Ray V. Warman, Andrew J. Downey, Theodore F. W. Meyer, William E. Scripps.

DETROIT.—Fuller Construction Co. has the general contract for the 23-story addition to the Penobscot building, to cost $1,500,000; the building was designed by Donaldson & Meier; five elevators will be installed.

GRAND RAPIDS, MICH.—Multiple Tool Co. has been incorporated; $50,000 capital stock; by Claude Hurd, Frank T. Hulswit, Richard Shaddelee, H. R. Green.

GRAYLING, MICH.—Du Pont De Nemours Powder Co., Wilmington, will establish a $150,000 branch plant for the manufacture of charcoal and alcohol as soon as weather permits.

MARQUETTE, MICH.—This city is preparing to build another flume from the Dead river dam and an additional power plant to supply additional light and power for the city; Chas. Retallic is superintendent.

THREE RIVERS, MICH.—Shafer Brothers are building a garage and machine shop, one story, 50 x 145 feet, for the K. C. Beam Welding & Machine Co.; machine equipment will be needed.

ARGYLE, WIS.—Phillipson Bros. are having plans prepared by J. R. Law, architect, Madison, Wis., for a $20,000 fireproof building to contain a garage and machine shop on the first floor.

DE PERE, WIS.—The common council of De Pere has met the request of the Western

That Hesitation

Mark Twain once mentioned a man whom he thought must have a prodigious quantity of mind—it took him so long to make it up.

We believe such men live today, but they are not successful sales managers.

First know where to go, then don't hesitate—go after 'em.

We show you the way—

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Des Moines Electric Co., Des Moines, Ia., of which H. E. Chubbuck is president, is planning improvements to cost about $500,000; new turbo-generators, boilers and auxiliary apparatus will be installed. The larger portion of the money will be used for additions to the power plant.

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G. Amsinck & Co., 6 Hanover street, New York City, have put out a list of six tools for export.

Steel & Iron Works that a culvert and sewer extension be constructed west of its plant so that an addition doubling its present size can be erected this year. The Western company threatened to accept a proposition from the commercial club at Green Bay, to locate in that city unless the city of De Pere made necessary improvements in the vicinity of its works.

GREEN BAY, WIS.—Board of education has ordered an architects' competition to procure suitable plans for an addition to the East side high school, which is to contain a manual training and a domestic science department.

JANESVILLE, WIS.—Elmer J. Manning, civil engineer, has been granted patents on an improved two-cycle internal combustion engine and an improved carburetor and is soliciting the assistance of local capital with the idea of manufacturing the devices; the basis of the improvement is ventilating the motor and vaporizing the fuel to a higher degree than attained thus far.

JEFFERSON, WIS.—New equipment of steel cells, extension of indirect radiation system of heating and other improvements are included in the remodeling of the Jefferson county jail authorized by the county board; plans are being made by Allan D. Conover, architect, Madison, and bids will be taken by John F. Welch, county clerk.

LA CROSSE, WIS.—La Crosse county highway commissioner is making surveys for a 400-foot steel highway bridge to span Black river near Campbell; plans will probably be prepared by M. W. Torkelson, state bridge engineer, Madison; B. A. Jolweit is county clerk; construction will be undertaken this year.

MADISON, WIS.—The Wisconsin Construction Co., Chippewa Falls, Wis., with local offices at 112 Orchard street, is taking bids for steel and other material for the proposed physical laboratory of the University of Wisconsin, the general contract for which was awarded to the company at $180,775, as previously noted.

MANITOWOC, WIS.—Manitowoc Clay Co. has been incorporated; $200,000 capital stock; by A. S. Green, Elmer Leach, H. M. Clark.

MARSHFIELD, WIS.—American Gas Construction Co., Newton, Ia., has petitioned the common council for a franchise to build a private gas plant with 15 miles of mains, with the alternative of building a municipal plant of the same size for the city at about $52,000.

MEDFORD, WIS.—Common council has granted permission to the Medford Electric Co. to build a power house and install additional equipment to increase the light and power service from 12 to 24 hours daily.

MILWAUKEE. — Roberts Brass Co. has been incorporated; $15,000 capital stock; by R. C. Zannoth, R. Perlick, A. M. Zannoth.

MILWAUKEE.—Boggis-Dietz Electric Co. has been incorporated; $10,000 capital stock; by H. F. Boggis, E. L. Dietz and E. Boggis.

MILWAUKEE.—Milwaukee Steel Type & Disc Co., capital stock $20,000, has been incorporated by A. C. Moeller, Fred R. Schreiner and Emmet Horan Jr., attorney.

MILWAUKEE.—Worden-Allen Co. has been awarded the general contract for the erection of the proposed gas engine shop of the Davis Manufacturing Co., of Milwaukee, in West Allis; foundations have been constructed.

MILWAUKEE. — Universal Oxygen Co., Sheboygan, Wis., manufacturer of welding and cutting equipment and tanked gas supplies, has purchased the business of the Wisconsin Welding & Cutting Co., a large welding shop at 176 Barclay street, Milwaukee, and will increase the equipment at once; the concern makes a specialty of custom work for machine shops, foundries and automobile shops.

MILWAUKEE.—Park commissioners have engaged Architect Alfred C. Clas, Colby-Abbot building, to prepare designs for a trestle over the C. & N. W. tracks from the foot of Mason street to the proposed terminus of the Lake Shore drive protection pier, to serve as a passageway for vehicles and pedestrians; it will consist of two steel spans with concrete and frame inclines and approaches; the work is to be done this year; Frank P. Schumacher is secretary.

NEW LONDON, WIS.—Wisconsin Seating Co., furniture and veneers, will erect two wing additions, 48 x 80 and 40 x 40 feet, to be used principally for the metal-working departments; equipment will be purchased at once; J. Zaug is superintendent.

POYSIPPI, WIS.—A steam railway eight and one-half miles in length will be constructed between Poysippi and Red Granite, Wis., by the Waushara County Railroad Co., which just has been incorporated with a capital stock of $25,000 by Richard Frank, J. E. Wendt, O. W. Strapp and A. L. Christofferson.

RACINE, WIS.—Joerns Motor Mfg. Co., motor cycles and gasoline motors, St. Paul, Minn., intends to move its plant to Racine, Wis., if conditions are found satisfactory; representatives are now in Racine looking over the ground.

RACINE, WIS.—Board of education has selected the plans drawn by Guilbert & Funston, architects, Racine, for the proposed $90,000 public school building, to contain manual training and domestic science departments, auditorium, etc.; the work will be done some time this year.

RACINE, WIS.—Northwestern Iron & Metal Co., Racine, Wis., has increased the capital stock from $10,000 to $15,000.

RHINELANDER, WIS. — Northwest Oil Co., Superior, Wis., will establish a branch house and distributing station at Rhinelander, and will spend from $10,000 to $12,000 in erecting buildings, tanks, etc.; A. F. Podvin is local manager.

SHEBOYGAN, WIS.—Globe Foundry & Machine Co. has increased its capital stock from $30,000 to $50,000.

WAUSAU, WIS.—Plans for the proposed $200,000 co-operative packing, cold storage and elevator plant to be erected this year by the Farmers' Co-Operative Packing Co., of Wausau, capital stock $250,000, are being prepared by architects of the department of agriculture, Washington, D. C.; work is to begin about March 1. Dr. D. Sauerhering, is president.

KANSAS CITY, MO.—Myers-Ebersole Motors Co. has been incorporated; $10,000 capital stock; by J. W. Ebersole, W. D. Myers, W. A. Boring.

KENNETT, MO.—Campbell Lumber & Supply Co. was incorporated at $35,000 to operate a lumber mill.

ST. JOSEPH, MO.—Fire did about $75,000 damage to the warehouse and power plant of the American Hominy Co.

ST. LOUIS.—Motor Screw Products Co. has increased its capital stock from $3,000 to $6,000.

ST. LOUIS.—C. J. and F. C. Briner, electrical engineers, will erect a $16,000 three-story building for factory purposes; the firm deals is electrical engines, dynamos, etc.

ST. LOUIS.—General Chemical Co., operating a plant in East St. Louis, Ill., is doubling the size of its plant and is adding an auxiliary plant to the first unit; improvements are to cost $300,000.

DES MOINES, IA.—Globe Machinery & Supply Co. plans to build soon on East Second street.

DES MOINES, IA.—R. G. MacDowell, architect, Good Block, is taking bids for a $20,000 warehouse of brick and steel, three stories, 40 x 134 feet.

DES MOINES, IA.—Frank McNamara and Frank Jacobson, Humbolt, Ia., have perfected plans for the establishment of a plant in East Des Moines for the manufacture of cement blocks, etc.; company will be known as the Frank Mfg. Co.

DES MOINES, IA.—The Des Moines Electric Co., of which H. E. Chubbuck is vice president, is planning improvements to cost about $500,000; new turbo-generators, boilers and auxiliary apparatus will be installed; the larger portion of the money will be used for additions to the power plant.

DUBUQUE, IA.—Trenk Wire Works were damaged by fire.

LARCHWOOD, IA.—A $10,000 bond issue has been sold and work will begin shortly on the construction of a municipal light and power plant, the plans for which are nearing completion.

MINNEAPOLIS.—Fire did about $7,000 damage to the warehouse of the Stockland Road Machinery Co.

MINNEAPOLIS.—Altschwager Bros. Co., automobile repairer, has leased land at Thirteenth street and Marquette avenue, and soon will remodel the building for a large garage and machine shop.

MINNEAPOLIS.—H. N. Leyton Co., 127 South Tenth street, has the general contract for a machine shop of brick and concrete, two stories and basement, 102 x 115 feet, for the Pillsbury Flour Mills Co.; cost will be about $40,000.

MINNEAPOLIS.—The city will require 500 tons of deformed mild steel bars for use in a reinforced concrete bridge across the Mississippi river at this point; the Concrete Steel Engineering Co., 21 Park Row, New York, is engineer in charge and K. E. Alexander, city hall is purchasing agent.

ST. PAUL.—Northern Insulating Co. will erect a $25,000 fireproof building for manufacturing purposes on Wabash street.

ST. PAUL.—St. Paul Gas Light Co. has given the general contract to the General Construction Co., 511 Chamber of Commerce building, for an engine and boiler house of brick and steel, one-story, 20 x 40 feet and 14 x 32 feet.

ST. PAUL.—St. Paul Structural Steel Co. has been incorporated at $50,000 and plans the erection of a plant; the company's work in the meantime will be done by another manufacturing concern; offices have been opened in the New York Life building; unfinished steel will be purchased; Harry C. Palmer, president; Thomas M. Comfort, secretary-treasurer.

SOUTHERN STATES

BIRMINGHAM, ALA.—People's Hydro-Electric Power Co. has been incorporated; $20,000 capital stock; R. H. Cobb, president, Clem Jowers, vice president and treasurer; S. H. Richardson, secretary.

HOUSTON, TEX.—County Engineer Burnell will prepare plans for a $15,000 steel bridge over Brays bayou at Harrisburg.

LAWTON, OKLA.—Stephens Machine & Foundry Co. has been incorporated; $10,000 capital stock; by Fred Cowell, J. R. Yarborough, B. R. Stephens.

WESTERN STATES

GREAT FALLS, MONT.—Dalbey-Lockhart Steel Co. has been incorporated to manufacture fabricating steel to be used in concrete construction $25,000 capital stock; by E. H. Dalbey, C. B. Lockhart, James H. Bondy; building site not decided upon.

WALLACE, IDA.—Russell Collins, one of the chief owners of the H. E. & M. property,

says a concentrator is to be erected this year of at least 150 tons capacity.

BELLINGHAM, WASH.—Kirby ship yards have been awarded a contract by the Bellingham-Alaska Trade & Transportation Co. for the construction of a $150,000 steamer.

BELLINGHAM, WASH. — It is reported the Slift Motor Co. will start work about March 1 on a gas engine and ship chandlery plant; C. X. Folsom is a member of the company.

SEATTLE. — Eagle Harbor Transportation Co. has awarded a contract for a 120-foot, steel hull passenger carrier to the Anderson Steamboat Co. at an estimated price of $35,000.

SEATTLE. — Seattle Construction & Dry Dock Co. has been awarded a contract by the Electric Boat Co. of New Jersey for three coast defense submarines at about $1,350,000; the awarding of this contract is in conformity with a law authorizing expenditure for vessels, calling for at least three to be constructed on the Pacific coast.

SPOKANE, WASH. — Frye Packing Co., Seattle, has leased a site in Spokane and will erect a $50,000 packing plant.

SPOKANE, WASH.—MacCamy Cooler & Condenser Co. has been incorporated at $150,000 and will start work shortly on the construction of a condenser at the Union Iron Works; H. E. McCamy, superintendent of the Union Iron Works, is interested.

BANDON, ORE.—Port of Bandon has been organized with Col. H. R. Ross as president; it proposes to construct or purchase a dredge for harbor work.

ENTERPRISE, ORE.—Valley & Siletz is negotiating for the right of way between Airlee and Independent; it is considered probable that construction will begin in March.

GRANTS PASS, ORE. — The commercial club and mining men of the district, are planning the construction of a custom mill for the treatment of ores.

PORTLAND, ORE.—Commissioner Daly of the department of public works has been authorized to offer for sale 500 water meters 20 years old and to ask bids on 500 new ones.

PORTLAND, ORE.—Cowlitz Bridge Co., Yeon building, has been awarded a contract for the construction of nine steel bridges at the Dalles-Celilo canal, aggregating $19,260.

PORTLAND, ORE.—City council will be asked by the commission of public docks to submit a bond issue of $900,000, of which $500,000 will be used in constructing a grain elevator.

PORTLAND, ORE. — Coin Machine Mfg. Co. has purchased a 3-acre site at East Seventeenth and Alice streets for the erection of factory buildings; the first structure to be erected will be a two-story, fireproof building to cost from $50,000 to $75,000 including machinery.

PORTLAND, ORE.—Bids will be received by the Columbia river interstate bridge commission at the county court house until 2 p. m., Feb. 23 for a general contract on the construction of the Columbia river interstate bridge and approaches; bridge and approaches are for highway and street car traffic and comprise about 5,000 linear feet of steel structure requiring about 9,500 tons of steel and 12,000 linear feet of embankment; certified check for 10 per cent of bid required; plans may be had from the secretary of the commission at Vancouver, Wash., by depositing $25.

TERREBON, ORE.—It is reported J. B. Roesman, Thomas Hart and others have found gold in sufficient quantities along the Crooked and Deschutes rivers to justify them in constructing mills near here.

ONTARIO, CAL.—Homer Motor Co., Los Angeles, has plans practically completed for a $100,000 plant to be erected in Ontario for the manufacture of light and heavy delivery trucks and farm tractors.

SAN PABLO, CAL.—Steelite Co., manufacturer of explosives, is considering the purchase of a site for the erection of a $10,000 plant.

New Trade Publications

GRINDING MACHINES.—The St. Louis Machine Tool Co., St. Louis, Mo., has issued a circular describing various types of grinding machines. Special attention is given to illustration and description of a new self-contained countershaft machine.

PAINT TESTS.—A bulletin has been issued by the Joseph Dixon Crucible Co., Jersey City, N. J., covering the Atlantic City paint tests. Considerable interesting information regarding the weather resisting qualities of metal paints is presented.

SMALL MOTORS.—A bulletin recently issued by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is devoted to small motors of alternating and direct current types. These motors are furnished in various capacities from 1-20 to 1 horsepower.

PNEUMATIC TOOLS.—In a 4-page bulletin issued by the Monarch Pneumatic Tool Co., East St. Louis, Ill., various types of drills, wood borers, riveting and chipping hammers are described and illustrated. Tables giving the size, weight and capacity of these tools also are included.

CRANES. — Maris Bros., Philadelphia, recently have issued a series of bulletins devoted to their various types of cranes, including double beam hand cranes, single beam cranes, I-beam trolleys, chain hoists, combined hoist and trolley, freight handling and transfer cranes. The bulletins describe these cranes in detail and their application to various classes of work.

GEARS.—Bulletin No. 48,702, issued by the General Electric Co., describes the construction and application of noiseless gears, which heretofore have been known as cloth pinions. They are designed particularly for transmitting power from motors to machinery without noise. Numerous illustrations are included in the booklet showing applications of these gears to many different kinds of machines.

MAGNETIC SWITCHES.—A 16-page booklet has been issued by the Cutler-Hammer Mfg. Co., Milwaukee, covering its line of magnetic switches for controlling electrical circuits. The booklet includes descriptions of clapper type controllers, shunt switches, magnetic lock-out switches, spring closed switches, overload relays, master controllers, grid resistance, knife switch, alternating current magnetic switches, etc.

STEEL CHAINS.—A profusely illustrated 40-page booklet covering steel chains recently has been issued by the Link-Belt Co., Chicago. Various types of bushed roller chains with offset and straight side bars are covered, together with roller chains without bushings, plain riveted chains, bushed chains without rollers, miscellaneous chains and various forms of attachment links. Complete tables of dimensions are included.

POWER PRESSES.—Catalog No. 14, issued by the Max Ams Machine Co., Mt. Vernon, N. Y., describes and illustrates various types and sizes of power presses including bench presses, inclinable presses, double action presses, horning and wiring presses, punch presses, open back presses, arch presses, straight sided presses, double crank, knuckle-joint and other types. The catalog contains 104 pages and each machine is carefully illustrated and thoroughly described.

HEAT-TREATING FURNACES. — In a four-page bulletin, issued by the Quigley Furnace & Foundry Co., Springfield, Mass., under-fired, temperature heat-treating furnaces using gas or oil fuel are illustrated and described. The furnaces are adapted for annealing, hardening, tempering and case-hardening as applied to the making of tools, dies, taps, punches, cutters, screws, springs, machine parts, roller bearings, sheet metal stampings, spinnings, etc., requiring great uniformity of temperature.

STEEL SASH.—An unusually complete and attractive catalog covering various types of steel sash, sash operating devices, steel partition, counterweighted sash, etc., has been issued by the David Lupton's Sons Co., Philadelphia. This catalog, No. 8, supersedes previous editions. Diagrams showing the section frames of various types of steel sash are presented, together with tables giving complete dimensions. Numerous illustrations are included in the catalog showing buildings fitted with Lupton sash.

METERS.—Bulletin No. 40, issued by the Sangamo Electric Co., Springfield, Ill., illustrates and describes a line of electric watt-hour meters and current and potential transformers manufactured by this concern. The features of the instrument are thoroughly described and data are given regarding the proper method of mounting and connecting. A brief mention is also made of the other products of the Sangamo Electric Co., including ampere-hour meters, curve drawing wattmeters, distant recorders, circuit breakers, shunts, etc.

HEAT RECORDING INSTRUMENTS.—An exhaustive bulletin describing various types of indicating and recording thermometers and pyrometers has been issued by the Foxboro Co., Foxboro, Mass. The construction details of the instruments manufactured by this concern are fully covered and a large number of specimen charts showing the continuous graphic temperature records are presented. Price lists and specifications also are included, together with details regarding protection tubes, chart files, etc. Another bulletin issued by the Foxboro Co. describes differential recording gages in an equally comprehensive manner.

HEAT-TREATING FURNACES.—Overfired heat-treating furnaces designed for gas or oil fuel are described and illustrated in bulletin No. 6 issued by the Quigley Furnace & Foundry Co., 105 West Fortieth street, New York. It is said that the operation of these furnaces depends in no way upon draft or weather conditions, no chimney being required. To quickly check or lower the temperature a number of dampers which may be partially or wholly opened are placed in the top of the combustion chamber, thus permitting the escape of heat from the combustion chamber directly into the atmosphere. The various features of the furnace are covered in the bulletin.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Delivery to April 1.)

Bessemer, valley	$13.75
Bessemer, Pittsburgh	14.70
Basic, Pittsburgh	13.45
Basic, eastern Pa.	13.50
Malleable, Pittsburgh	13.70 to 13.95
Malleable foundry, Chicago	13.00 to 13.50
Malleable foundry, Philadelphia	15.00 to 15.25
Malleable foundry, Buffalo	13.00 to 13.25
No. 1X foundry, Philadelphia	14.50 to 14.75
No. 2 foundry, Pittsburgh	13.95
No. 2 foundry, valley	13.00
No. 2 foundry, Cleveland	13.25 to 13.50
No. 2 foundry, Ironton	12.75
No. 2 foundry, Chicago	13.00 to 13.50
No. 2X foundry, Philadelphia	14.25 to 14.50
No. 2X fdy., N. J. tidewater	14.25 to 14.50
No. 2X foundry, Buffalo	13.00 to 13.25
No. 2 plain, Philadelphia	14.00 to 14.25
No. 2 plain, N. J. tidewater	14.00 to 14.25
No. 2 plain, Buffalo	12.75 to 13.00
No. 2 southern, Birmingham	9.50 to 9.75
No. 2 southern, Cincinnati	12.40
No. 2 southern, Chicago	13.75 to 14.00
No. 2 southern, Phila. delivery	14.00 to 14.50
No. 2 southern, Cleveland	13.50 to 13.75
No. 2 south'n, New York, docks	13.75 to 14.00
No. 2 southern Boston, docks	13.75 to 14.25
No. 2 south'n, interior New Eng.	14.50 to 15.50
No. 2 southern, St. Louis	14.00 to 14.25
Virginia No. 2X furnace	12.50 to 12.75
Virginia 2X, Philadelphia	15.25 to 15.50
Virginia 2X, Jersey City	15.50 to 15.75
Virginia 2X, Boston points	15.75 to 16.00
Gray forge, eastern Pa.	13.25 to 13.50
Gray forge, Pittsburgh	13.45 to 13.70
Gray forge, Birmingham	8.75 to 9.00
Silveries, 8 per cent, Jackson, O.	15.75 to 16.00
Silveries, 5 per cent Birmingham	12.50
Silveries, 5 per cent, Chicago	16.35
Standard low phos., Phil.	19.00 to 20.00
Lebanon low phos., furnace	16.00 to 16.50
Low phos., Pittsburgh	20.95 to 21.20
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	15.75 to 16.75
Charcoal, Birmingham	25.00

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bess., 51½ per cent	3.00
Mesabi non-Bessemer, 51½ per cent	2.85

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7c
Foreign non-Bess., 50 to 65 per cent	7c

COKE

(At the ovens)

Connellsville furnace	$1.55 to 1.65
Connellsville fur. contr	1.65 to 1.75
Connellsville foundry	2.00 to 2.40
Connellsville fdy., contr	2.25 to 2.50
Wise county furnace	1.75 to 2.00
Wise county foundry	2.10 to 2.40
Pocahontas furnace	1.75 to 2.00
Pocahontas foundry	2.00 to 2.25
New River, foundry	2.50 to 3.00
New River, furnace	2.00 to 2.25

FERRO-ALLOYS

Ferro-manganese, Baltimore	$68.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent. Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Open-hearth billets, Phila.	$21.40 to 21.90
Forging billets, Phila.	24.40 to 25.40
Forging billets, Pbgh.	24.00 to 24.50

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama canal, per 100 lbs., in carload lots, exclusive of insurance and dockage.

From New York	$0.30
From Pittsburgh	.46
From Youngstown	.48
From Niles	.48
From Wheeling	.46
From Steubenville	.46
From Johnstown	.445
From Coatesville	.39
From Steelton	.40
From Bethlehem	.375
From Cleveland	.49
From Chicago	.60

Wire rods, Pittsburgh	$25.00
Billets, Pittsburgh	19.50 to 20.50
Billets, Youngstown	18.50 to 19.50
Sheet bars, Pittsburgh	20.00 to 21.00
Sheet bars, Youngstown	19.00 to 20.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Lgt. rails, 8-lbs., Pbgh. & Chgo.	1.22c
Lgt. rails, 12 lbs., Pbg. & Chgo.	1.17c
Lgt. rails, 16 to 20 lbs., Pbgh. & Chgo.	1.12c
Lgt. rails, 25 to 45 lbs., Pbgh. and Chgo.	1.07c
Relaying rails, standard, Pbgh. & Chgo.	$23.00 to 24.00
Relaying rails, light, Chicago	21.50 to 22.50
Angle bars, st. sect. Pbgh. base.	1.50c
Angle bars, st. sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.35c to 1.40c
Spikes, railroad, Chgo.	1.50c
Track bolts, Pbgh.	1.85c
Track bolts, Chgo.	2.00c

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—	
Cleveland	$0.95
Newark, N. J.	2.85
New England	2.85
Philadelphia	2.65
Pittsburgh	.95
St. Louis	3.18
Buffalo to:—	
Albany, N. Y.	$1.20
New England (all rail)	2.45
New York and Brooklyn (all rail)	2.45
New York and Brooklyn (by canal)	1.00 to 1.50
Virginia furnaces to:—	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York docks (r. and w.)	2.88
Birmingham, Ala., to:—	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
New York (all rail)	6.15
New York (rail and water)	4.25
Philadelphia (all rail)	5.20
Philadelphia (rail and water)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
Chicago to:—	
Des Moines	$2.80
Milwaukee	.50
Moline, Ill.	1.47
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:—	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.10c
Structural shapes, Chicago	1.29c
Structural shapes, Philadelphia	1.25c to 1.30c
Structural shapes, New York	1.26c to 1.31c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.25c to 1.29c
Tank plates, Pittsburgh	1.10c
Tank plates, Philadelphia	1.25c to 1.30c
Tank plates, New York	1.26c to 1.31c
Bars, soft steel, Pittsburgh	1.10c
Bars, soft steel, Chicago	1.29c
Bars, soft steel, Philadelphia	1.25c to 1.30c
Bars, soft steel, New York	1.26c to 1.31c
Hoops, carloads, Pittsburgh	1.25c
Hoops, less carloads, Pittsburgh	1.30c
Bands, Pittsburgh	1.10c
Shafting, carloads, Pbgh., disc. contract	66 to 67
Shafting, less carl'ds, Pbgh., disc.	63
Bar iron, Chicago	1.00c to 1.05c
Bar iron, Philadelphia	1.12c to 1.22c
Bar iron, New York	1.10c to 1.15c
Bar iron, Cleveland	1.15c
Bar iron, Pittsburgh	1.10c to 1.15c
Hard steel bars, Chicago	1.20c to 1.25c
Smooth finish, mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.80c
No. 28, black, Chicago	1.99c to 2.04c
No. 28, tin mill, black, Pbgh.	1.85c
No. 28, galvanized, Pbgh., nom.	2.90c
No. 28, galvanized, Chgo.	Not quoted
No. 10, blue, annealed, Pbgh.	1.30c to 1.35c
No. 10, blue, annealed, Phila.	1.50c to 1.55c
Tin plate, 100 lb., coke base	$3.10 to 3.20

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickled, cold roll., and re-anl.	30 cents
Hot roll'd, pickl'd and anl., tin mill	25 cents
Full pickl'd, cold rolled and re-anl.	50 cents
Auto sheets	75 cents
Blued stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller levelling	10 cents
Patent levelling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxidizing	10 cents
Lime finish	10 cents
Open-hearth stamping steel, free from mill scale	55 cents
Special open-hearth deep stpg. steel free from mill scale	80 cents
Extra deep special auto body stock	$1.25
Ext. for 28 gage ov. 32 to 36-in. wide	10 cents

No reduction for sheets not annealed.

The above extras apply on both sheet and tin mill specifications, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

	Black. Butt-weld.	Galv. Butt-weld.
Steel, ⅜ to 3 inches	81	72½
Iron, ¾ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	80	71½

BOILER TUBES

Steel, 3½ to 4½ inches	74
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.55
Wire nails, retailers, Pittsburgh	1.60
Plain wire, jobbers, Pittsburgh	1.35
Plain wire retailers, Pittsburgh	1.40
Galvanized wire, jobbers, Pbgh.	1.70 to 1.75
Galvanized wire, retailers, Pbgh.	1.75 to 1.80
Polished staples, Pbgh.	1.50 to 1.55
Galvanized staples, Pbgh.	1.90 to 1.95
Barb wire, painted, jobbers, Pbgh.	1.50 to 1.55
Barb wire, painted, retailers, Pbgh.	1.55 to 1.60
Barb wire, galv., retailers, Pbgh.	1.95 to 2.00
Barb wire, galv., jobbers, Pbgh.	1.90 to 1.95

IRON AND STEEL PRICES

Corrected up to Tuesday noon

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ½ x 6 inches, smaller or shorter, rolled threads, 80 and 20; cut threads 80 and 15; larger or longer, 75 to 15.

Machine bolts with hot pressed nuts ½ x 4 inches, smaller or shorter, rolled, 80 and 25; cut, 80 and 20; larger or longer, 80.

Gimlet and cone point lag or coach screws, 80 and 25.

Hot pressed square, blank or tapped nuts, $6.30 off list; hot pressed hexagon blank or tapped, $7.20 off.

Cold pressed, c. and t. square, blank or tapped, $6 off; hexagon, blank or tapped, ½ inch and larger, $7.20; ⅜-inch and smaller, $7.80.

RIVETS

Structural rivets, Pbgh	1.45c to 1.50c
Structural rivets, Chgo	1.68c
Boiler rivets, Pbgh	1.55c to 1.60c
Boiler rivets, Chgo	1.78c

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

COLD ROLLED STRIP STEEL

(Subject to regular extras.)

0.10 to 0.19 Carbon.	Base price Cut to length Hard.	Soft.
1½ inch and wider	2.85	3.10
0.100 and thicker	2.95	3.20
0.050 to 0.099 inc.	3.10	3.35
0.035 to 0.049 inc.	3.35	3.75
0.031 to 0.034 inc.	3.60	4.00
0.025 to 0.030 inc.	3.80	4.20
0.020 to 0.024 inc.	4.70	5.20
0.017 to 0.019 inc.	5.10	5.60
0.015 and 0.016	5.95	6.45
0.013 and 0.014	6.55	7.05
0.012	6.90	7.40
0.011	7.25	7.75
0.010	Coils.	
0.100 and thicker	2.75	3.00
0.050 to 0.099 inc.	2.80	3.05
0.035 to 0.049 inc.	2.95	3.20
0.031 to 0.034 inc.	3.10	3.50
0.025 to 0.030 inc.	3.20	3.60
0.020 to 0.024 inc.	3.30	3.70
0.017 to 0.019 inc.	3.60	4.10
0.015 and 0.016	4.00	4.50
0.013 and 0.014	4.70	5.20
0.012	5.05	5.55
0.011	5.40	5.90
0.010	5.75	6.25

CAST IRON PIPE

Three to 20 in., Cleveland	$21.50
Twenty-four to 48-in., Cleveland	21.00
Four-inch, Chicago	26.00
Six to 12 inches, Chicago	24.00
Large sizes, Chicago	23.00
Six-inch, New York	20.00 to 20.50
Four-inch, Birmingham	19.50
Six-inch and larger, Birmingham	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.80c
Steel bars, Philadelphia	1.65c to 1.70c
Steel bars, New York	1.80c
Steel bars, St. Louis	1.70c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, St. Louis	1.65c
Iron bars, Cincinnati	1.60c to 1.70c
Iron bars, Philadelphia	1.60c to 1.65c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.85c
Shapes and plates, St. Louis	1.80c
Shapes and plates, Philadelphia	1.65c to 1.70c
Shapes and plates, New York	1.85c
No. 10 blue anl. sheets, Chgo	1.95c
No. 10 blue anl. sheets, Cleve.	2.05c
No. 10 blue anl. sh., St. Louis	2.00c
No. 10 blue anl. sheets, Cinci.	1.95c
No. 28 black sheets, Chgo	2.55c
No. 28 black sheets, Cleveland	2.45c
No. 28 black sheets, Cincinnati	2.45c to 2.55c
No. 28 black sheets, St. Louis	2.55c
No. 28 galv. sheets, Chgo	3.55c
No. 28 galv. sheets, Cleveland	3.35c
No. 28 galv. sheets, Cincinnati	3.40c to 3.55c
No. 28 galv. sheets, St. Louis	3.55c

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

IRON AND STEEL SCRAP

(Net Tons.)

No. 1 railroad wrought, Chgo	$ 8.75 to 9.00
No. 1 railroad wrought, Cleve	9.25 to 9.75
No. 1 railroad wrought, St. L	7.50 to 7.75
No. 1 railroad wrought, Cincin	8.00 to 8.50
No. 2 railroad wrought, Chgo	8.25 to 8.50
No. 2 railroad wrought, St. L	7.50 to 8.00
Arch bars and transoms, Chgo	11.75 to 12.25
Arch bars and transoms, St. L	11.00 to 11.50
Knuckles, coup. & spr'gs, Chgo	8.75 to 9.00
Knuckles, coup. & spr'gs, St. L	9.00 to 9.50
Iron car axles	14.75 to 15.25
Shafting, Chicago	11.75 to 12.25
Shafting, St. Louis	11.00 to 11.50
Steel car axles, Chicago	11.25 to 11.75
Steel car axles, St. Louis	11.00 to 11.50
Locomotive tires, Chicago	9.00 to 9.50
Locomotive tires, St. Louis	8.50 to 9.00
Cut forge, Chicago	8.25 to 8.50
Pipes and flues, Chicago	7.00 to 7.25
Pipes and flues, Cleveland	7.25 to 7.50

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11.6 cents
Baltimore	14½ cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Minneapolis and St. Paul	32.9 cents
Denver	68.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, (all rail)	80 cents
Pacific coast, via Panama canal	46 cents

Pipes and flues, St. Louis	5.75 to 6.25
No. 1 cast, Chicago	9.00 to 9.25
No. 1 cast, Cleveland	10.00 to 10.50
No. 1 cast, Cincinnati	8.50 to 9.00
No. 1 cast, St. Louis	9.00 to 9.25
No. 1 busheling, Chicago	8.00 to 8.25
No. 1 busheling, Cleveland	8.25 to 8.50
No. 1 busheling, Cincinnati	5.75 to 6.25
No. 1 busheling, St. Louis	7.50 to 7.75
No. 2 busheling, Chicago	6.50 to 7.00
No. 1 boiler plate, cut, Chgo	5.50 to 5.75
No. 1 boiler plate, cut Buffalo	9.00 to 9.50
No. 1 boiler plate, cut, St. L	5.50 to 5.75
Boiler punchings Chicago	8.25 to 8.75
Cast borings, Chicago	5.25 to 5.50
Cast borings, Cleveland	6.00 to 6.25
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	4.50 to 4.75
Machine shop turnings, Chicago	5.50 to 5.75
Machine shop turnings, Cleve	5.50 to 6.00
Machine shop turnings, Cinci	4.25 to 4.75
Machine shop turnings, St. L	5.00 to 5.50
Malleable agl., Chicago	$ 7.50 to 7.75
Malleable agricultural, St. Louis	6.50 to 7.00
Malleable, railroad, Chicago	7.75 to 8.25
Malleable, railroad, Cincinnati	7.00
Malleable, railroad, St. Louis	7.00 to 7.50
Angle bars, iron, Chicago	11.50 to 11.75
Angle bars, iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chgo	8.00 to 8.25
Angle bars, steel, St. Louis	8.50 to 8.75
Stove plate, Chicago	8.25 to 8.50
Stove plate, Cleveland	7.50
Stove plate, Buffalo	9.00 to 9.75
Stove plate, Cincinnati	6.50 to 7.00
Stove plate, St. Louis	7.25 to 7.50
Bundled sheet, Cincinnati	4.00 to 4.50

(Gross Tons.)

Heavy melting steel, Pbgh	$11.75
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chgo	9.00 to 9.50
Heavy melting steel, Cleveland	9.75 to 10.00
Heavy melting steel, Cincinnati	9.00 to 9.50
Heavy melting steel, eastern Pa.	10.00 to 10.25
Heavy melting steel, New York	8.00 to 9.15
Heavy melting steel, St. Louis	9.75 to 10.25
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.00 to 9.25
Grate bars, New York	6.50 to 7.00
No. 1 railroad wrought, east, Pa.	11.50 to 12.00
No. 1 railroad wrought, Pbgh	10.25 to 10.75
No. 1 R. R. wght., New York	9.50 to 10.00
No. 1 R. R. wrought, Buffalo	10.00 to 10.50
Shafting, New York	11.50 to 12.00
Shafting, eastern Pa.	13.50 to 14.00
Wrought pipe, New York	7.25 to 7.50
Wrought pipe, eastern Pa.	10.00 to 10.50
Mch. shop turnings, New York	5.50 to 6.00
Machine shop turnings, Buffalo	5.50 to 6.00
Mch. shop turnings, Pbgh	7.75 to 8.00
Mch. shop turnings, eastern Pa.	8.00 to 8.50
Cast borings, New York	5.50 to 6.00
Cast borings, eastern Pa.	8.00 to 8.50
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.00 to 8.50
Stove plate, N. J. points	8.00 to 8.50
Stove plate, Pittsburgh	8.50 to 9.00
Stove plate, eastern Pa.	8.50 to 9.00
Shoveling steel, Chicago	8.25 to 8.75
Shoveling steel, St. Louis	8.00 to 8.50
Reroll'g rails, 5 ft. & ov., Pbgh	11.50 to 12.00
Reroll. rails, 5 ft. & ov., Chgo	9.50 to 9.75
Reroll. rails, 5 ft. & ov., Cleve	11.00 to 11.50
Reroll. rails, 5 ft. & ov., E. Pa.	10.50 to 11.00
Reroll. rails, 5 ft. & ov., St. L.	10.75 to 11.25
Steel rails, short, Chicago	9.50 to 10.00
Steel rails, short, Cleveland	11.00 to 11.50
Steel rails, short, St. Louis	10.25 to 10.50
Iron rails, Cleveland nom.	11.75 to 12.00
Iron rails, Chgo	12.00 to 12.50
Iron rails, Cincinnati	10.25 to 10.75
Iron rails, eastern Pa.	13.50 to 14.00
Iron rails, St. Louis	10.50 to 11.00
Iron rails, Pittsburgh	13.00 to 13.50
Frogs, switches, guards, Chgo	9.00 to 9.25
Frogs, switches & g'rds, St. L.	9.75 to 10.25
Car wheels, (iron), Pittsburgh	10.50 to 11.00
Car wheels, (steel), Pittsburgh	11.50 to 12.00
Car wheels, Chicago	10.00 to 10.50
Car wheels, eastern Pa.	10.50 to 11.00
Car wheels, Buffalo	10.50 to 11.00
Car wheels, N. J. points	9.25 to 9.50
Car wheels, St. Louis	10.50 to 11.00
Iron axles, Pittsburgh	18.00 to 18.50
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	18.50 to 19.00
Iron axles, Buffalo	19.00 to 19.50
Iron axles, Chicago	15.50 to 16.00
Steel car axles, New York	11.50 to 12.00
Steel car axles, Buffalo	12.00 to 12.50
Steel car axles, Cleveland	12.50 to 13.00
Steel car axles, eastern Pa.	13.50 to 14.00
No. 1 busheling, Buffalo	8.25 to 8.75
No. 1 busheling, Pittsburgh	9.75
No. 2 busheling, Buffalo	5.75 to 6.25
Low phosphorus steel, Buffalo	14.00 to 14.50
Low phosphorus steel, Pbgh	13.25
Low phos. steel, eastern Pa.	13.50 to 14.00
No. 1 forge, eastern Pa.	7.75 to 8.25
No. 1 cast, eastern Pa.	11.75 to 12.25
No. 1 cast, Pittsburgh	11.25 to 11.75
No. 1 heavy cast N. J. points	11.00 to 11.50
Mall. iron, R. R., Cleveland	9.25 to 9.75
Malleable railroad, Pittsburgh	10.00
Malleable, R. R., Buffalo	9.25 to 9.75
Malleable, R. R., east Pa.	8.00 to 8.50
Bundled sheet, Pittsburgh	9.25 to 9.50
Bundled sheet, Cleveland	7.50

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The Selling Price of Castings

(*Continued from page 230.*)

by the average tonnage from which the general cost is established."

The replies indicate that the majority of the foundries have fairly accurate methods of obtaining the cost of the iron in the ladle, although in several instances merely the cost of the iron, scrap and fuel are considered, no allowance being made for melting losses, etc.

Do you base your estimates on data previously obtained from your cost system? This inquiry was made for the purpose of ascertaining to what extent foundrymen have installed cost systems and with only few exceptions, they replied that the estimates were based on such data.

The foregoing indicates that foundrymen generally realize the necessity of making proper estimates, yet the absence of some standard system or formula makes it practically impossible for any two foundrymen to arrive at approximately the same quotation of new work. It is apparent also that estimating schools established by several trades would prove of value to foundrymen generally and the consideration of such a move is earnestly urged upon the cost committee of the association. Furthermore, the time available for the consideration of these replies made it practically impossible to summarize the large amount of valuable information that can be obtained from them. It is suggested that the cost committee pursue this investigation further with a view of establishing a standard formula for estimating the selling price of the foundry output.

Malleable Iron for Automobiles

(*Continued from page 224.*)

the average as actually some portions of the casting contract 5/16-inch and others nothing at all, depending upon the design, the temperature of pouring, etc." That contraction and not shrinkage is meant is specifically stated in the lines above the ones just quoted. Now, as castings must cool from the temperature of solidification, it would be interesting to learn how some parts of the castings can violate the laws that have to do with the cooling of hot bodies.

Effect of Carbon on Solidity

We find also in the paper the following: "With the well-known lack of fluidity of white iron, etc." In view of the fact that Dr. Moldenke claims that the average carbon content in white iron runs 3 per cent, and with the thought that carbon imparts more fluidity to iron than any element in it, aside perhaps from phosphorus, I would ask why this lack of fluidity? Is there any ferrous product from which castings are made that is more fluid than white iron, aside from gray iron which contains more carbon and more phosphorus? I have lately seen some 20 or more very fine shoe buckles made from air furnace iron, and taken from one flask, the combined weight of which, I was told, did not amount to half an ounce. This at least shows reasonable fluidity.

Again, quoting from the paper, "If a flat piece of malleable which has been made in the ordinary manner, with oxide of iron packed in annealing boxes, is put on a planer and successive thicknesses of metal taken off, and these analyzed for carbon, the quantity will vary from very little at the skin to the full amount about ¼-inch inward." By the term, full amount, I take it that the author means that at ¼-inch inward there will be found the same amount of carbon in the annealed piece as was in the

white iron when cast. I feel safe in making this inference, as this statement has been more positively made in recent articles written by the author.

Now, years ago the statement made by Dr. Moldenke was considered correct. Today, it is very well known that such is not the case, under the conditions as given by him. Without quoting numerous other experiments made in the past, will simply explain that I have just finished some investigations on nine flat malleable iron test bars, that happily have been made with an iron oxide packing, and are of such dimensions as will test out the statement made, and quoted above.

These bars are rectangular, and 1-inch wide by 9/16-inch thick, while the length is about 6 inches. To furnish a test right up to date, a part of one of these bars has been machined, and ¼-inch removed from all of four sides, thus leaving a narrow strip ½-inch wide by 1/16-inch thick.

This has been run through for carbon, by combustion, and I might mention that the carbon determinations I have already referred to were made in the same manner. We find that the total carbon content in this piece is 1.56 per cent, but Dr. Moldenke would have us believe that it should analyze close on to 3 per cent in total carbon.

Personally, I have reason to believe that there may be a very slight difference in the carbon content of the layers of iron as the center is approached, but I believe the difference to be not only slight, but absolutely inconsequential. An examination of hundreds of sections of malleable iron castings metallographically, makes me have no fear in stating that the carbon throughout the section is distributed with beautiful uniformity, and this is a much better way to investigate this matter than through chemical analysis, as every part of the section can be seen and studied.

In the Society of Automobile Engineers' Bulletin, May, 1913, in an article I wrote for the association, under the title "Malleable Iron Castings", can be seen three micrographs of an annealed piece of malleable iron that was 2 inches in diameter, and several inches long. One of the micrographs represents the structure very close to the surface; another between this point and the center; while the third was taken directly at the center.

These show almost perfect uniformity in the distribution of the carbon throughout the section, and in a piece 2 inches in diameter.

Jolt Stripping Plate Machine

(*Continued from page 225.*)

draw cylinders, which rapidly strip the flask and stripping plate upward from the pattern. After the mold is lifted away, the valve handle is turned to the opposite position; this supplies air above the piston for returning the stripping plate to its original position. It is said that it is not necessary to wait while the exhaust escapes from underneath the cylinder and then depend upon gravity for the return of the plate. The air pressure admitted above the piston drives the plate back rapidly. The power return also furnishes sufficient force to overcome the resistance caused by sand wedging between the pattern and the stripping plate.

The Lackawanna deseaming process which was fully described in the Dec. 10 issue of THE IRON TRADE REVIEW is the subject of a handsomely illustrated booklet recently issued by the Lackawanna Steel Co., Buffalo, N. Y. The details of the deseaming process for steel rails are fully covered and numerous illustrations are presented showing the apparatus used in the process and the results obtained.

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Position Wanted Minimum, 25 words, 50c. Each additional word, 2c. All capitals, 25 words, 75c. Each additional word, 3c.

Miscellaneous Classified Minimum, 25 words, $1.00. Each additional word, 4c. All capitals, 25 words, $2.00. Each additional word, 8c.

Remittance should be made to cover eight (8) words for address if box number is used.

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STEEL SALESMAN WANTED TO REPRESENT a well known manufacturer of hollow and solid drill steel; must be a first class man with thorough knowledge of the mining trade in the western territory. Apply with full particulars to Box 326, THE IRON TRADE REVIEW, Cleveland, O.

IRON FOUNDRY FOREMAN WANTED: A young man about thirty to thirty-five years of age, who has had some experience in up-to-date heavy foundry work, and also molding machines, can secure good, permanent position with chances of advancement. State salary expected, full particulars as to experience and references. Address Box 329, THE IRON TRADE REVIEW, Cleveland, O.

Positions Wanted

WANTED: — POSITION AS SUPERINTENDENT or foreman by a thoroughly practical and capable man of 20 years experience in erecting iron stairways, railings, store fronts and general ornamental iron work. Address Box 108, THE IRON TRADE REVIEW, Cleveland, O.

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POSITION WANTED BY FIRST CLASS master mechanic familiar with rolling mill, blast furnace and steel plant work; have more than twelve years' experience in charge of the above lines of work and am thoroughly familiar with it and the management of help; open for engagement to take charge Jan. 1, 1915; best references. Address Box 261, THE IRON TRADE REVIEW, Cleveland, O.

CHEMIST (GRADUATE), TWO YEARS' experience in iron and steel laboratory, wants position as assistant or take charge of small laboratory. Address Box 288, THE IRON TRADE REVIEW, Cleveland, O.

SKELP ROLLER, 17 YEARS' EXPErience; first class mechanic; careful worker; best references; inventive ability; also knows proper drafting of rolls; desires position with good firm. Correspondence solicited. Address Box 298, THE IRON TRADE REVIEW, Cleveland, O.

QUALITY SHEET STEEL REQUIRES special knowledge. Metallurgist desires position where operating experience in producing finest grades of sheets will be valuable; references. Address Box 302, THE IRON TRADE REVIEW, Cleveland, O.

STEEL WORKS CHEMIST; GRADUATE, experienced in alloy steel; desires charge of laboratory or first assistant's position; cannot accept less than $150 and can earn it; would prefer position that requires some outside work, especially about the open-hearth. Address Box 308, THE IRON TRADE REVIEW, Cleveland, O.

MASTER MECHANIC OR MACHINE shop foreman wants position; 29; married; technical education; 12 years' experience rolling mills and blast furnaces; best references. Address Box 313, THE IRON TRADE REVIEW, Cleveland, O.

EXPERIENCED TECHNICAL PUBLICITY AND EXPORT MAN, 10 YEARS' EXPERIENCE, KNOWLEDGE OF SPANISH LANGUAGE AND SOUTH AMERICAN TRADE, DESIRES WORK WHERE ABILITY WILL BE PROPERLY REWARDED. ADDRESS BOX 320, THE IRON TRADE REVIEW, CLEVELAND, O.

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